INTERNATIONAL CIVIL AVIATION ORGANIZATION

TWENTY FIFTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (APANPIRG/25)

Kuala Lumpur, Malaysia, 8 – 11 September 2014

Agenda Item 3: Performance Framework for Regional Air Navigation Planning and Implementation

3.2: ATM

ATM/SG/2 OUTCOMES

(Presented by the Secretariat)

SUMMARY

This paper presents information on the Second Meeting of the APANPIRG Air Traffic Management Sub-Group (ATM/SG/2), which was held at Hong Kong, China from 04 to 08 August 2014.

1. INTRODUCTION

1.1 The ATM/SG/2 meeting was attended by 84 participants from 20 States, two Special Administrative Regions of China and four International Organizations, including Australia, Hong Kong China, Macao China, French Polynesia, India, Indonesia, Japan, Lao PDR, Malaysia, Maldives, Mongolia, Myanmar, Nepal, New Zealand, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand, Tonga, USA, Viet Nam, IATA, IFATCA, IFALPA and ICAO.

1.2 A total of 33 Working Papers (WP), 17 Information Papers (IP) and 1 flimsy were considered by the meeting. The ATM/SG/2 meeting developed 16 Draft Conclusions, two Draft Decisions, and two Decisions.

2. DISCUSSION

APANPIRG Follow-Up on An-Conf/12 Recommendations

2.1 The ATM/SG/2 studied the responses provided by ICAO on the fifty-six recommendations from the Twelfth Air Navigation Conference (AN-Conf/12, Montréal, 19 to 30 November 2012). It was noted that APANPIRG Sub-groups were expected to submit a consolidated report on the outcomes of these actions to APANPIRG/25 on the basis of *Conclusion 24/4: Follow-up to AN-Conf/12 Recommendations by States and International Organizations*.

2.2 In relation to recommendation 1/16, Hong Kong China asked whether there had been further developments in consideration of the concept of ‘best equipped best served’. The meeting noted the development of the performance-based airspace concept that would be discussed in ATM/SG/2/WP15.

RASMAG/19 Outcomes

2.3 The ATM/SG/2 meeting noted that greater effort and urgency appeared to be required by States to investigate and reduce ATC operational errors, and implement full AIDC capability. In the case of AIDC, the meeting agreed that it would be beneficial to form a short-term AIDC Implementation Task Force that focused on the South China Sea (SCS) and Bay of Bengal (BOB). Noting APANPIRG Conclusion 24/17: *AIDC Implementation* and Conclusion 24/27: *Prioritization of AIDC Implementation to Address LHDs*, and the continued incidence of Large Height Deviations (LHDs) in the BOB and SCS area, the ATM/SG/2 endorsed the following Draft Conclusion: RASMAG Draft Conclusion 19-4: *Asia/Pacific AIDC Implementation Task Force* (which would become a CNS/SG Draft Conclusion).

Seamless ATM

2.4 The ATM/SG/2 meeting noted the implementation seminars on Seamless ATM in accordance with APANPIRG Decision 24/56, that the Asia/Pacific Regional Office had conducted:

- 10 September 2013: Bangkok, Thailand (ASEAN Air Transport Working Group - (ATWG);
- 23 – 25 September 2013, Beijing, China (Europe – Asia Trans-regional Special Coordination Meeting);
- 21 October 2013: Hyderabad, India (Bay of Bengal, Arabian Sea and Indian Ocean Region - BOBASIO);
- 26 November 2013, Bangkok, Thailand (Collaborative Development of Operational Safety and Continuing Airworthiness Programme-Southeast Asia - COSCAP-SEA);
- 27 November 2013, Bangkok, Thailand Meteorological Requirements Task Force (MET-R/TF);
- 28 November 2013: Bangkok, Thailand (Civil Air Navigation Services Organisation - CANSO); and
- 24 March 2014: Singapore (Inaugural ATM Research Institute Seminar).

2.5 The meeting also noted that Air Navigation Report Forms (ANRFs) had replaced the Performance Framework Forms (PFF). The ANRF were intended to be a means of setting milestones, targets, and metrics for each of the key planning elements. The ATM/SG/2 had no comment on the draft ANRFs.

2.6 The meeting was concerned by the slow reporting of Seamless ATM implementation progress, in accordance with APANPIRG Conclusion 24/55 c). Since APANPIRG/24, only 13 States and administrations (Australia, Bangladesh, China, French Polynesia, Hong Kong China, India, Japan, Republic of Korea, Malaysia, New Zealand, Singapore, Thailand, and the United States) had submitted their first Seamless ATM reporting form. The remaining States and administrations that had not reported were reminded to submit a Seamless ATM reporting form as soon as possible.

2.7 In regard to Regional priorities and targets, The ATM/SG endorsed the following CNS/SG Draft Conclusions on the Seamless ATM Reporting and Regional Priorities and Targets:

- Draft Conclusion 18/2: *Regional Priorities and Targets*;
- Draft Conclusion 18/20 *ANRFs and Responsibility Matrix*;
- Draft Conclusion 18/21 *Seamless ATM Implementation Guidance*; and
- Draft Conclusion 18/22 *Web-based reporting process*.

Alignment of the RANP with the Global Air Navigation Plan

2.8 ICAO reported on the work of the eANP Working Group (eANP WG) which was formed in follow-up to the 12th Air Navigation Conference Recommendation 6/1 *Regional Performance Framework – Planning Methodologies and Tools* regarding the alignment of regional air navigation plans with the Fourth Edition of the GANP, and proposals to develop a new Asia/Pacific Regional Air Navigation Plan (RANP) document.

2.9 The ATM/SG/2 agreed with the following work plan (**Table 1**) to assist the Regional Office (RO) through electronic means and established meetings to populate or develop the new Asia/Pacific RANP, so agreement on its content might be reached by mid-2015:

Reference	Detail	Notes
Vol. I, Part I	Table GEN I-1 List of FIR names and States	RO (ATM)
Vol. I, Part II	AOP Special Regional Requirements, if any	AOP/WG; RO (AGA)
Vol. I, Part II	Table AOP I-1 International Aerodromes	RANP data; RO (AGA)
Vol. I, Part IV	Table ATM I-1 FIR descriptions	ICAOHQ data; RO (ATM)
Vol. I, Part IV	ATM Special Regional Requirements, if any	ATM/SG; RO (ATM)
Vol. I, Part VI	SAR Special Regional Requirements, if any	APSAR/TF; RO (ATM)
Vol. I, Part VI	Table SAR I-1 Search and Rescue Regions	ICAOHQ data; RO (ATM)
Vol. I, Part VII	AIM Special Regional Requirements, if any	AAI/TF; RO (ATM)
Vol. II, Part I	Table GEN II-1 Major Traffic Flows	ATM/SG; RO (ATM)
Vol. II, Part II	AOP Special Regional Requirements, if any	AOP/WG; RO (AGA)
Vol. II, Part II	Assessment of aerodrome capacity	AOP/WG; RO (AGA)
Vol. II, Part IV	Process for ATS route designation*	ATM/SG; RO (ATM)
Vol. II, Part IV	Table ATM II-2 ATS Routes*	ATS Route Catalogue data
Vol. II, Part IV	Secondary Surveillance Radar (SSR) Codes	ATM/SG; RO (ATM)
Vol. II, Part VI	SAR SRR Facilities	RANP; RO (ATM)
Vol. II, Part VII	Table II-1 AIM responsibilities	AAI/TF; RO (ATM)
Vol. II, Part VII	Table II-2 AIM chart responsibilities	AAI/TF; RO (ATM)

Table 1: RANP Work Plan
*This was a temporary process until the ICARD ATS Route feature became available, at which time Table ATM-II ATS Routes would be deleted from the RANP by the RO.

Flight Plan 2012 Follow-up

2.10 IATA presented the results of a CANSO post-implementation survey of ICAO FPL 2012 (Amendment 1 to ICAO Doc 4444 – PANS-ATM), with particular reference to the use of flight plan converter systems. The survey report commented on the use of converter systems, noting that while the proliferation of converter solutions had offered a practical and cost-effective short-term solution for States to meet the Amendment 1 implementation date, the benefits of new aircraft capability indicators in the ICAO flight plan were lost in the backward conversion process. The survey report also stated that ANSPs that had chosen to adopt the converter solution must not abandon plans to migrate at an early date to delivery of the full functionality of the PANS-ATM changes.

2.11 Hong Kong, China suggested that a new survey should cover other aspects that had been noted as an issue (e.g.: item 10, alphanumeric call signs, use of the letter 'J' and the indicator RVR/). ICAO noted that surveys had been conducted on this matter as a result of APANPIRG Conclusions 21/6, 21/13 and 23/1, so the regional office would conduct a follow up survey.

2.12 Singapore announced the eventual termination of the Repetitive Flight Plan (RPL) system to reduce the workload of operators, pilots and air traffic controllers and the loading of the Aeronautical Fixed Telecommunication Network (AFTN).

2.13 The meeting discussed whether the group should propose a regional position on the use of RPL. It was agreed that further information on the current use of RPL and the extent of any problems would be sought by the Secretariat for consideration by relevant ATM coordination groups and ATM/SG/3 in 2015. It was also agreed that this did not impede States from proceeding with plans to dispense with RPL. IFATCA noted that the issue of RPL was also likely to be addressed globally in the next stage of FPL development leading to Flight and Flow Information for a Collaborative Environment (FF-ICE).

Performance-Based Airspace Regional Supplementary Procedures

2.14 The meeting was informed of Proposals for Amendment (PfA) to ICAO Doc. 7030 *Regional Supplementary Procedures* to support State mandates for performance-based airspace including PBN airspace and Controller Pilot Data Link Communications (CPDLC), Mode S Secondary Surveillance Radar (SSR) transponder, Airborne Collision Avoidance System (ACAS) II, Automatic Dependent Surveillance-Broadcast (ADS-B), and Automatic Dependent Surveillance-Contract (ADS-C) equipage for aircraft operating outside territorial airspace, within the area of responsibility of the State. The ATM/SG/2 noted that APANPIRG had adopted a number Conclusions supporting mandates for the carriage and use of ADS-B, ADS-C and CPDLC equipment within portions of airspace within their area of responsibility, and priority for access to such airspace:

- *Conclusion 22/8 – ADS-B Airspace Mandate*
- *Conclusion 22/36 – Amendment to Regional Supplementary Procedures on ADS-B*
- *Conclusion 23/5 – Asia/Pacific Air Navigation Concept of Operations Mandates*
- *Conclusion 24/39 – Asia/Pacific Regional PBN Implementation Plan Ver. 4*

2.15 The following PfAs had been drafted by the ICAO Asia/Pacific Regional Office:

- APAC-S 14/07 – MID/ASIA/PAC, supporting State mandates for carriage and operation of serviceable CPDLC equipment (**Attachment A**);
- APAC-S 14/08 – MID/ASIA/PAC, removing reference to the redundant standard RNP 12.6, and supporting State PBN airspace mandates (**Attachment B**); and
- APAC-S 14/09 – MID/ASIA/PAC, supporting State mandates for carriage and operation of serviceable of SSR Mode S transponders, ACAS II, ADS-C and ADS-B equipment (**Attachment C**).

2.16 The PfAs would provide a framework for Asia/Pacific States to establish performance-based airspace by enabling States to promulgate PBN airspace and equipage mandates in airspace over the High Seas. They were intended to encourage a regional approach to the establishment of such mandates, where it is appropriate to do so. It was recognized that unlike some regions, it was not practical for the Asia/Pacific Region to establish region-wide simultaneous mandates.

2.17 Following discussion at APANPIRG/25, the PfAs would be circulated to States and International Organizations for formal comment before then being submitted for Council Approval in late October 2014.

2.18 It was clarified that the PfAs were enablers for States that desired to implement performance based airspace mandates, and did not compel States to do so. Moreover, the meeting noted that the PfAs provided for the implementation of airspace designation in accordance with 'conditions mandated by the State with responsibility for the FIR concerned' – allowing flexibility such as an exclusive or non-exclusive model.

Communication/Navigation and Surveillance Sub-Group Outcomes

2.19 The ATM/SG/2 noted the outcomes of the Eighteenth Meeting of the Communications/Navigation and Surveillance Sub-Group of APANPIRG (CNS SG/18, Beijing, China, from 21 – 25 July 2014). CNS SG/18 Conclusions and Decisions relevant to ATM SG included the following:

- *Draft Conclusion 18/1 Response to AN-Conf/12 Recommendations* – The ATM/SG/2 meeting endorsed CNS/SG Draft Conclusion 18/1, noting that the consolidated response of APANPIRG sub-groups would be presented under this Draft Conclusion*;*
- *Draft Conclusion 18/2 Regional Priorities and Targets* – The ATM/SG/2 meeting endorsed CNS/SG Draft Conclusion 18/2*;*
- *Draft Decision 18/3 AIDC Implementation Task Force* – Hong Kong China requested clarification of the process for Draft Conclusion 18/3 in respect of the second Draft Conclusion on the same subject from the RASMAG/19 report. ICAO clarified that there would be only one CNS/SG Draft Conclusion as the two Draft Conclusions (RASMAG/19 and CNS/SG/18) would be combined;

  The USA noted that two separate Sub-Groups had identified the need for the AIDC/TF. India expressed support for the AIDC/TF, so the ATM/SG/2 meeting endorsed the Draft Conclusion*;*
- *Draft Conclusion 18/8 Harmonization for AIDC Implementation* – The ATM/SG/2 meeting discussed this Draft Conclusion and were not clear why this Draft Conclusion was necessary, given that it could have formed part of the AIDC/TF Terms of Reference. ICAO advised that this would be discussed internally within the Regional Office*;*
- *Draft Conclusion 18/12 Adoption of PAN Regional ICD for AIDC* – This Draft Conclusion was endorsed by the ATM/SG/2 meeting*;*
- *Decision 18/14 Support Formation of PBN ICG* – Hong Kong, China stated that the current focus for PBN was not the planning of PBN but the implementation of PBN. They emphasised that this implementation work was supposed to be conducted by the RSO in accordance with *Decision 24/40 - Dissolution of the PBN Task Force*, whereby APANPIRG had noted that PBN policy making would reside with the CNS/SG, and the RSO could play an important part in day-to-day PBN implementation assistance, with its Asia/Pacific Flight Procedures Programme (FPP);

  ICAO noted that the new group was not continuing the policy making and guidance material work of the PBN/TF, but was supporting implementation work;

  The United States was concerned that more intensive ad hoc regular contact and coordination was required than might be possible within a formally constituted workgroup; thus the ATM/SG/2 did not concur with the CNS/SG Decision*;*
- *Draft Decision 18/16 Revised ADS-B Guidance Document (AIGD)* – The ATM/SG/2 meeting endorsed this Draft Decision, noting that the amendment provided guidance on synergies between ADS-B and GNSS, revised ATC phraseology and clarification of flight planning requirements*;*

- *Draft Conclusion 18/17 Flight Plan Item 10 – ADS-B Indicators* – Hong Kong China supported the Draft Conclusion, but asked if there could be wider scope and consideration of flight plan issues included in the flight plan format, to include items such as the expansion to eight flight ID characters, and the limitations of the 16 PBN characters. ICAO undertook to discuss the matter with ICAOHQ, but noted that the advice from ICAOHQ had been that there was a low probability of a PANS-ATM flight plan change in the near future. The ATM/SG/2 meeting endorsed the CNS/SG/18 Draft Conclusion*;*
- *Draft Conclusion 18/18 Regulations for Compliance of ADS-B Transmissions* Hong Kong suggested consulting with flight operations experts. ICAO advised that the ADS-B Study and Implementation Task Force (SITF) had included operational input. The ATM/SG/2 Chair noted that the Draft Conclusion had two separate portions, which may require two separate Draft Conclusions. The ATM/SG/2 meeting endorsed the Draft Conclusion*.*

2.20 The meeting discussed Draft Conclusions 18/2, 18/20, 18/21 and 18/22 separately under the Seamless ATM item.

2.21 Regarding the need for efficient separation standards, IATA noted that the SCS western portion had ATS surveillance and data sharing in place and had seen good service improvement and thanked Singapore and Vietnam for implementing 30NM longitudinal on portions of routes L642 and M771. However the eastern side was still being served by procedural separation. IATA wanted to ensure that the Philippines planning for ADS-B implementation included coverage of the eastern part of the SCS, and that Brunei (planned for 2015 but to be confirmed), Malaysia, Philippines, Singapore and Vietnam would expand the sharing of ADS-B data to enable implementation of optimised separations to improve the service provision in this area. This position was consistent with the APANPIRG Conclusion 24/16 on enhancing surveillance and communications capability in the SCS.

Air Traffic Flow Management Steering Group Outcomes

2.22 The meeting was updated on the outcomes of the Second and Third Meetings of the Air Traffic Flow Management Steering Group (ATFM/SG/2, Hong Kong, China, 1 – 4 October 2013 and ATFM/SG/3, Singapore, 10 – 14 March 2014).

2.23 IATA had supported and commissioned a study by external subject matter expert(s) to establish a baseline of current ATFM capabilities and future plans, and then develop a possible implementation strategy for further consideration by ATFM/SG and States. Thus far, only Cambodia, Nepal, Pakistan and Sri Lanka had not responded to the survey.

2.24 Hong Kong China, Singapore and Thailand had initiated a collaborative effort to develop a concept of ATFM based on CDM through sub-regional cooperation, and involving the development of a distributed regional ATFM network. Unlike ATFM solutions based on centralised systems such as those found in Europe and North America, the concept was for a distributed multi-nodal ATFM network of interconnected ATFM nodes residing within individual ANSPs, forming a larger virtual ATFM platform for the sub-region or region.

2.25 The concept had been further developed, the number of participating States has broadened to include Australia, China, Indonesia, Malaysia and Vietnam, and trials were planned. A significant further developments of the concept was the according to airspace users of greater flexibility to manage delays through collaboration and negotiation with ANSPs and airport operators. The ATFM/SG recognized the concept as viable and adaptable for the region, and agreed that the elements captured in the concept should be considered for inclusion in the Regional ATFM framework.

2.26 China, Japan and the Republic of Korea had agreed to the establishment of the North Asia Regional ATFM Harmonization Group (NARAHG), and had requested the support of the ICAO Asia/Pacific Regional Sub-Office (RSO) to serve as facilitator to the group and coordinate progress meetings, which would be hosted by the States involved. The group aimed to develop harmonized technical and operational communications protocols and procedures in accordance with ICAO Doc 9971 and the regional ATFM framework.

2.27 It was envisaged that the Regional Collaborative ATFM Framework would be contributory to, and its structure and format aligned with, the Seamless ATM Plan. The final draft of the Regional Framework for Collaborative ATFM was expected to be produced by ATFM/SG/5 in early-to-mid 2015, for submission to APANPIRG/26 in September 2015, through ATM/SG/3.

2.28 ATFM/SG/2 agreed that, given the time required for development of the regional ATFM framework, there was also the need to develop within a shorter timeframe guidance material for the implementation of interim ATFM procedures before the formal approval by APANPIRG/26, particularly in cases where little or no organized or targeted ATFM was currently in place. This informal guidance material would be placed on the Asia/Pacific website for any States that wished to access it.

2.29 Noting the subsuming of ATFM-relevant provisions of global and Asia/Pacific Region ATFM-related documents into the (then) draft Doc 9971, the Conclusions adopted by APANPIRG/24, and its adoption of the Seamless ATM Plan, revised TOR for ATFM/SG were drafted. The ATM/SG noted the need to include reference to the AOP/WG and an overview of A-CDM. India stressed the need for ATFM interface harmonisation and control measures. The following Draft Decision was agreed by the ATM Sub-Group, for consideration by APANPIRG:

Draft Decision ATM/SG/2-1: ATFM/SG Terms of Reference

That, the proposed Terms of Reference appended at [**Attachment D**] be adopted for the Asia/Pacific Air Traffic Flow Management Steering Group (ATFM/SG).

South Asian ATM Improvements

2.30 India presented details of the User Preferred Route (UPR) Geographic Zone that was recently established in the Arabian Sea and Indian Ocean by Arabian Sea - Indian Ocean ATS Coordination Group (ASIOACG) and Indian Ocean Strategic Partnership to Reduce Emissions (INSPIRE) members. The UPR Zone extended over 10 FIRs, and was a result of extensive collaboration among member ANSPs, participating airlines and IATA. Reports from participating airlines had confirmed that there were combined average annual savings of 8,500 tonnes of fuel savings (equivalent to 27,000 tonnes of CO_2 emissions) by flying UPRs within the UPR Zone.

2.31 India advised they would implement 30NM longitudinal separation between RNP 4 approved aircraft on selected RNP 10 ATS (M300, N571, P570 and P574), noting that airlines would benefit even if 30NM was implemented only within the Indian FIRs. However, India stressed that there was an urgent need for adjacent States to implement the 50NM and 30NM separation standards to enhance the benefits of a uniform application of separation standards across the entire airspace.

2.32 India had reviewed the existing Indian airspace structure and developed an airspace management strategy to maintain uniform service levels through upper airspace harmonisation. Each FIR would have only one Area Control Centre (ACC) with multiple sectors at Chennai, Kolkata, Delhi and Mumbai, thereby amalgamating 12 ACCs into four ACCs initially, and subsequently into two ACCs. India had also harnessed appropriate CNS technologies, including the use of advanced ATM Automation systems, to cope with the growth of air traffic. Those technologies included a new state-of-the-art ATS automation system, enhanced and overlapping ATS surveillance and Very High Frequency (VHF) coverage that enabled harmonization of upper airspace within the Kolkata FIR.

New Ha Noi FIR ATC Centre

2.33 Viet Nam presented information on the construction of a new Ha Noi FIR ACC, which was built at a new location about 30 kilometres southeast of Noi Bai International Airport. Ha Noi ATCC was expected to be put into operation from December 2014 in three phases, so that the new ACC would gradually take over the responsibility until full operations from June 2015. Among many features, the ACC would have significant ATM automation capability.

2.34 Thailand asked whether there would be a re-sectorisation as Ha Noi ATCC took responsibility of one Sector from Ho Chi Minh ATCC, to which Viet Nam confirmed that there would be no changes. In response to a question, Viet Nam advised that the new ATC Centre would use paper flight progress strips as well as electronic flight progress strips. ICAO recalled the advice of the Seamless ATM Plan, which stated that the use of electronic flight progress strips only was preferred, to ensure the minimisation of transcription errors and reduce ATC workload.

Integration of Human Factors in Research, Operations and Acquisition

2.35 The United States presented information on the Federal Aviation Administration's (FAA's) use of a multidisciplinary human factors analysis in the development and operations of ATM systems. They noted that in the field of ATM where safety, efficiency, and continuity were critical elements of virtually every area of expertise, people were often both the greatest assets and the greatest source of risk. Human factors research had indicated that the top five safety risks in ATM nearly always involved 'human error'; thus as airspace air traffic and ATM systems become more complex, the analysis and optimization of the human component was essential.

2.36 The FAA had integrated human factors analysis and engineering into all six stages of its acquisition life cycle; service analysis and strategic planning, concepts and requirements definition, initial investment analysis, final investment analysis, solution implementation and in-service management. Human factors experts performed unique monitoring and analysis during each stage and provided guidance throughout the cycle.

2.37 There was considerable discussion by the ATM/SG/2 on this topic. India, Hong Kong, China and IFATCA all emphasised the importance of human-in-the-loop planning at the earliest stage of project management. The meeting considered that there was a significant need for improvement in human factors knowledge and input into the development of appropriate processes for system engineering, procedure design, procedures and training. The ATM/SG/2 meeting agreed to the following Draft Conclusion:

Draft Conclusion ATM/SG/2-2: Human Performance Initiatives

That, ICAO be urged to:

a) conduct an Asia/Pacific human performance seminar/workshop for optimal air traffic control and search and rescue operational safety and efficiency; and

b) review the human performance provisions in the Asia/Pacific Seamless ATM Plan.

2.38 The meeting was reminded that the Seamless ATM Plan was updated on a three-year cycle, and the outcomes of any human factors study in the Asia/Pacific Region could be included in the next update of the Plan in 2016, if agreed by APANPIRG.

Regional ATM Contingency Plan Task Force Outcomes

2.39 The meeting was informed of the outcomes of the Third Meeting of the Regional ATM Contingency Plan Task Force (RACP/TF/3, Bangkok, Thailand, 12 – 15 March 2013).

2.40 RACP/TF noted that, unlike the cases of North America and Europe, the Asia/Pacific Region did not have the benefit of a network ATFM capability that would help to manage contingency events. Moreover, it may be easy to identify contingency routes but these were subject to operational conditions. Thus it was considered that it was more useful to harmonize contingency routes on a sub-Regional basis and retain flexibility for Level 2 (inter-State) contingency arrangements.

2.41 RACP/TF noted the existing multi-State contingency arrangements for Large Scale Weather Deviations (LSWD) in the South China Sea area. While weather deviation events may not normally be a matter for contingency planning as such, RACP/TF supported the addressing of LSWD considerations in the Regional ATM Contingency Plan.

2.42 RACP/TF/1 (Bangkok, Thailand, 17 – 19 April 2012) had formed a Contingency Plan Task Force Review Team to review relevant portions of Level 1 (internal State) and Level 2 ATM Contingency Plans, based on Basic Planning Elements (BPE) agreed by the RACP/TF. The latest update of the ATM Contingency Readiness Analysis is provided at **Attachment E**.

2.43 To conduct further work on the development of the Regional ATM Contingency Plan it was agreed that the Small Working Groups (SWG) established by the RACP/TF to develop contingency route structures and Flight Level Allocation Schemes (FLAS) should continue on a geographical, sub-Regional basis.

2.44 The finalization of the Regional ATM Contingency Plan was aligned with the Regional Framework for Collaborative ATFM, with both plans being made available before the implementation date of the Seamless ATM Plan's Phase 1 Preferred ATM Service Levels (November 2015). The current draft of the Regional ATM Contingency Plan was presented to the ATM/SG/2.

2.45 At the ATM/SG/2 Australia noted that the draft Basic Plan Elements (BPE) included in the draft Contingency Plan referred only to Search and Rescue (SAR) alerting, and not to SAR operations conducted by the Rescue Coordination Centre (RCC). Recognizing that RCC were often incorporated into ATM centres and facilities and conducted by ATM personnel, it was agreed by the meeting that it was necessary to include SAR operations as well as SAR alerting in Regional ATM Contingency Plan considerations.

2.46 The Task Force Terms of Reference required that the Regional ATM Contingency Plan, where practical, provided contingency planning templates for States. The RACPTF considered that it was more practical for each contingency plan to individually ascertain if any neighbouring State would be either affected or involved, thus requiring an inter-State (Level 2) contingency plan arrangement or agreement. A single template would be developed that included Level 1 contingency measures and, where necessary, any Level 2 arrangements.

2.47 The RACP/TF/3 meeting was reminded that Annex 11 required States to have contingency plans. Thus, States without contingency plans should continue to develop them with a view to later modification to conform to the Regional ATM Contingency Plan, rather than waiting for the Regional ATM Contingency Plan and its templates to be produced.

2.48 The RACP/TF/3 meeting reviewed the RACP/TF Terms of Reference and agreed to minor amendments to reflect the recently renamed ATM Sub-Group (ATM/SG), and the Meteorological Hazards Task Force (MET/H TF). The ATM/SG/2 meeting agreed to the following Draft Decision developed by the RACP/TF/3 meeting, for APANPIRG's consideration:

Draft Decision ATM/SG/2-3: **Amend RACP/TF Terms of Reference**.

That, the amended RACP/TF Terms of Reference in **[Attachment F]** be adopted.

Afghanistan Airspace Contingency Planning

2.49 ICAO provided information on certain aspects of the transition from military to civilian control of Afghanistan's airspace, and suggested considerations for sub-regional airspace contingency planning, should the Kabul FIR become restricted, either in part of as a whole. Currently, the situation in Afghanistan remained fluid, with no certainty regarding the level of Air Traffic Control (ATC) services. The ATC contract for provision of services from the Kabul ACC was due to expire in December 2014 and would not be renewed by the military. The Afghanistan government was in negotiations to contract services, but as at the ATM/SG/2 meeting the contract had not been awarded.

2.50 Besides the uncertainty regarding security and the transition from military to civilian control of the Kabul FIR during the second half of 2014, there were also significant uncertainties regarding the provision of air navigation services in Afghanistan. It was clear that some planning was necessary by the States involved and IATA to ensure the least possible disruption and safety of operations affected by any reduction in air navigation services within the Kabul FIR. This was a matter of some urgency, given the reduction of international support in the next four months.

2.51 IATA stated that the development of contingency routes and procedures for Afghanistan was of paramount importance, and should be undertaken as a matter of urgency. They stated that many airlines would be planning to avoid the Kabul FIR in the same way that they were currently avoiding other airspace defined by their risk management processes. Noting that most carriers were able to utilise Iranian airspace, they stressed that reasonable contingency routing schemes were of vital importance, as a number of alternative options involved substantial costs that may threaten the financial viability of affected airlines.

2.52 The ATM/SG/2 meeting recognised that the overriding importance of the contingency planning for the Kabul FIR required an urgent response. An ad hoc group made up of affected States and International Organizations to examine the situation and develop proposals for contingency operations.in the event of disruption to services or unsafe airspace in the Kabul FIR was proposed.

2.53 Thailand notified the meeting that they would support contingency measures as far as possible, and that the Bay of Bengal Cooperative Air Traffic Flow Management System (BOBCAT) could be reconfigured to provide enhanced services.

2.54 It was noted that there needed to be coordination between the ICAO EUR/NAT Office (Paris), MID Office (Cairo) and the Asia/Pacific Office. In this regard, the meeting were apprised of the forthcoming Fourth Meeting of the Trans-Regional Airspace and Supporting ATM Systems Steering Group (TRASAS/4, 29 to 31 October 2014, Bangkok), at which all three offices would be present.

2.55 The ATM/SG/2 meeting agreed to the following Decision developed by the RACP/TF/3 meeting, for APANPIRG's consideration:

Decision ATM/SG/2-4: Ad Hoc Afghanistan Contingency Group

That, an ad hoc group is convened supported by the ICAO Asia/Pacific Office to urgently discuss contingency planning to address any contingency aspects for the continued safe and efficient operation of aircraft between Europe and the Asia/Pacific Region, consisting of IATA, IFALPA, Afghanistan, China, India, Iran, Oman, Pakistan, Singapore, the United States, Thailand and other affected parties as necessary.

SAIOACG/4 and SEACG/21 Meeting Outcomes

2.56 The Secretariat presented an overview of the outcomes of the SAIOACG/4 and SEACG/21 meetings, which were held as a combined meeting. There were 23 WP, 13 IP, and three Flimsies considered by the meetings.

2.57 The SAIOACG4/SEACG21 meeting had noted that with the advent of ADS-B, enhanced surveillance coverage over the BOB could allow the application of more efficient surveillance-based separations in the area. India had advised that Port Blair ADS-B would be operational in April 2014. IFATCA noted the current FLAS was implemented some time ago, and that it was causing capacity problems. The SAIOACG4/SEACG21 meeting was invited to note that the Asia-Pacific Seamless ATM Plan stated that FLAS should only be utilized for safety and efficiency reasons in category S airspace when crossing track conflictions occurred within 50NM of FIR boundaries, or if ATS surveillance coverage did not overlap the FIR Boundary concerned, or ATS surveillance data was not exchanged between ATC units concerned. The SAIOACG4/SEACG21 meeting agreed that the majority of issues would be solved by ATS surveillance, and then there should be no need for the FLAS.

2.58 The Mekong ATM Coordination Group (MK-ATM/CG), the Group of Five ANSPs Informal ATM Coordination Group (G5) and the Bangladesh-India-Myanmar-Thailand ATM Coordination Group Meeting (BIMT) were working on new ATS route structures in accordance with the Asia-Pacific Seamless ATM Plan using the new PBN navigation specifications. A Flimsy (**Attachment G**) was developed which presented the basic differences between PBN specifications to aid State planning.

2.59 India presented a proposal at SAIOACG4/SEACG21 to enable a nationwide harmonised transition altitude (TA) in accordance with Recommendation 5/1b of the Air Navigation Conference, which had been discussed with neighbouring States. This had also been briefly discussed at the ATM/SG/1 meeting (WP18, Pakistan). India proposed a uniform transition level of FL150. While acknowledging the difficulties of changing a national standard, in general, the SAIOACG4/SEACG21 meeting noted the possibility and merits of a sub-regional South Asian TA in the order of 13,000ft and a Southeast Asia TA of 11,000ft.

2.60 ICAO had presented information at SAIOACG4/SEACG21 on separation standards applicable in airspace served by ATS surveillance, and their contribution to improvements in airspace capacity and efficiency. It included references to PANS/ATM standards, and the Asia/Pacific Region's expectation of the application of appropriate separation minimums as agreed by APANPIRG in its adoption of the Asia/Pacific Seamless ATM Plan. It was recognised that extension of ATS surveillance coverage such as ADS-B brought a number of significant capacity, efficiency and safety benefits, but only where accompanied by implementation of surveillance based separation standards. SAIOCG/3 and SEACG/20 observed that overly-conservative separation minimums were both applied and planned within surveillance coverage in some critical areas of Asia/Pacific airspace, and the Seamless ATM Plan (PASL included the expectation to use the horizontal separation minima stated in PANS ATM, or as close to the separation minima as practicable). IFATCA and IATA expressed their complete support for the paper.

2.61 Singapore had presented an update on the implementation of ADS-B within the Singapore FIR to the SAIOACG4/SEACG21. Hong Kong, China ultimately supported exclusive ADS-B airspace. Singapore advised it was monitoring non-compliant affected airframes, which were not allowed to operate within the ADS-B airspace. Singapore informed the meeting that States were sharing information on non-ADS-B airframes. IATA thanked Singapore for their cooperation in reducing the incidence of non-compliant operations.

2.62 Thailand informed the SAIOACG4/SEACG21 that they expected implementation of AIDC aircraft transfer of control to enable an approximately 20% increase in airspace capacity by freeing controllers from workload related to aircraft transfer-of-control coordination by voice. In addition, it was expected that the AIDC implementation will also bring associated safety benefits in reducing transfer-of-control errors.

2.63 Hong Kong, China provided an update of the RNP 4 implementation in Hong Kong FIR. After reviewing the situation and in order to reap early benefits, Hong Kong, China adopted a more practical approach on PBN implementation within the Hong Kong FIR using 'non-exclusive' airspace and only on L642 or M771 at or above FL290 by 11 December 2014.

2.64 Hong Kong, China presented a plan to the SAIOACG4/SEACG21 to rationalise some overflight route segments within the Hong Kong FIR to reduce conflict points in the congested airspace and thereby improve flight safety. IATA expressed concern over the impact the change might have for certain city pairs in terms of additional flight distance, and agreed to conduct further analysis of the impact of the change with analysis from Hong Kong, China. The meeting noted that one of the reasons for the conflicts southeast of Hong Kong was due to the main southwest-northeast traffic flow using a modified single alternate FLOS. This caused reciprocal same level conflicts for traffic on A461 and A583. In response to a query from ICAO regarding the IATA analysis, the ATM/SG/2 meeting was informed that a city pair analysis showed significant penalties for some routes with the changes. However the changes had been implemented by Hong Kong, China and they confirmed that this had successfully reduced the controller workload and safety concerns.

2.65 The SAIOACG4/SEACG21 meeting had noted that RASMAG/18 also discussed the amended FLOS, which had caused LHDs because of the need for controller intervention to remedy reciprocal conflictions at the same level. The meeting was informed that ICAO preferred that States used the standard FLOS as per Appendix 3a of Annex 2 and in accordance with the Seamless ATM Plan. The meeting noted that the current FLOS had been implemented many years ago to address capacity issues, but there were now better ways of enhancing capacity such as closely spaced RNAV 5, RNAV 2 or RNP 2 routes, and the use of a more efficient ATS surveillance-based separation. The meeting recognised that China (Sanya FIR) was crucial to any such improvement, as they had indicated an inability to make route changes in the near future when the risks of the current FLOS had been discussed at RASMAG. The SAIOACG4/SEACG21 meeting agreed to the following Decision:

Decision SAIOACG4/SEACG4/2: Establishment of a Major Traffic Flow Review Group

That, recognizing the need for high capacity major traffic flow routes (MTF) between Southeast Asia and East Asia, and the effect of the current modified single alternate Flight Level Orientation Scheme (FLOS) that caused conflicts with crossing traffic, a group consisting of China, Hong Kong China, Malaysia, the Philippines, Singapore, Viet Nam, IATA, IFATCA and the ICAO RSO be established to review:

a) MTF conflicts with ATS routes A461 and A583; and

b) the overall South China Sea airspace, air route and the suitability of the FLOS to optimise airspace capacity and enhance flight safety in the long term; and

c) report outcomes of the review and recommendations to the ATM/SG/2 or SEACG/22 meetings.

2.66 The ICAO RSO advised the ATM/SG/2 meeting that it was coordinating with relevant stakeholders to establish the first meeting of the Major Traffic Flow Review Group in the December 2014 – February 2015 timeframe.

2.67 SAIOACG4/SEACG21 reviewed Version 13 of the Asia and Pacific Region ATS Route Catalogue. The ATM/SG/2 meeting agreed to the following Draft Conclusion for consideration by APANPIRG:

Draft Conclusion ATM/SG/2-5: ATS Route Catalogue Version 13

That Version 13 of the *Asia and Pacific Region ATS Route Catalogue* appended as [**Attachment H]** to the Report replaces Version 12 on the Asia/Pacific Regional Office's web site.

2.68 Indian airspace and ATS routes had undergone positive changes with the use of Flexible Use Airspace (FUA), RNAV and RNP, dynamic and flexible ATS route management and collaborative airspace design to generate major user benefits. India noted that the Republic of Korea had implemented RNAV 2 unidirectional routes with 8NM spacing and established ten RNAV 2 routes. The Republic of Korea had invited the 38th ICAO Assembly to encourage States to implement RNAV 2 parallel routes to improve operational efficiency, airspace capacity and operational benefit.

2.69 India had established a National High Level Policy Body (HLAPB) representing all civil and military service providers or users of airspace. A National Airspace Management Cell would be established at New Delhi and Regional Airspace Management Cells will be established at Chennai, Delhi, Kolkata, and Mumbai, with the progress of FUA implementation in a phased manner.

2.70 There was a near term plan to implement a Central Air Traffic Flow Management System in India, using airspace procedures that had been developed for military Special Use Airspace (SUA) in accordance with the principles of FUA. The meeting acknowledged and congratulated India for the positive changes in civil/military cooperation.

EATMCG Outcomes

2.71 IFATCA presented a summary of outcomes from the 7th East Asia Air Traffic Coordination Group (EATMCG) meeting, which was jointly hosted by CAA Taiwan and the Controllers Association of Taiwan (ROCATCA) at Songshan Airport, Taipei (15-16 April 2014). The EATMCG/7 meeting provided an opportunity for the ANSPs and ATC Associations in this area, including Hong Kong China, Japan, Republic of Korea, Philippines and Taiwan, to discuss current operational issues and coordinate the development of improved procedures and practices in line with the plans and objectives of the ICAO Asia Pacific Regional Office, and was attended by 43 delegates.

2.72 It was advised that Taiwan was conducting a comprehensive airspace study. Taiwan intended to comply with all ICAO requirements for upgrading their ATM facilities and procedures in line with the Asia/Pacific Seamless ATM Plan and would coordinate actions with adjacent States.

2.73 Hong Kong would implement full AIDC operations when their new ATC Centre was operational and Taiwan agreed to participate and cooperate in any interoperability tests (early 2015) and operational trials (mid to late 2015). Taiwan noted that the AIDC system between Japan and Taipei was not fully utilized and manual coordination in the transfer action was still required. Japan advised that their AIDC system was being upgraded to be fully interoperable with the Taiwan equipment and when operational, there will be no requirement for manual coordination.

2.74 The Republic of Korea noted that B576 was the busiest airway in Incheon FIR, carrying more than 36% of their total international traffic, resulting in frequent delays for Incheon traffic and a very heavy workload for controllers during the overnight peak period. Hong Kong China, Japan and Taiwan all attested to the problems they had in efficiently managing the night time peak traffic flows of Incheon flights. To alleviate the very busy traffic on B576, the EATMCG/7 meeting had agreed to the introduction of a second route within the Taipei and Fukuoka FIRs to join A586 in the Incheon FIR for flights to and from the Manila FIR during the peak traffic hours by the end of 2014.

AOP Working Group Outcomes

2.75 The Second Meeting of the Aerodrome Operations and Planning Working Group (AOPWG/2) of APANPIRG was held at Yogyakarta, Indonesia from 03 to 05 June 2014. The report from this meeting is presented separately in WP06 to APANPIRG under Agenda Item 3.1, which includes **Draft Conclusions ATM/SG/2-6** to **2-10**.

AIS – AIM Implementation Task Force Outcomes (WP22)

2.76 The Ninth Meeting of the Aeronautical Information Services – Aeronautical Information Management Implementation Task Force (AAITF/9) was held in Pattaya, Thailand, from 24 to 27 June 2014.

2.77 During AAITF/9 discussions it became apparent that only approximately 12% of meeting participants had access to Annex 15 to the Convention, or to the AIS manual. The ATM/SG/2 meeting agreed to the following Draft Conclusion for APANPIRG's consideration:

Draft Conclusion ATM/SG/2-11: Access to ICAO Annexes and Documents

That, States are urged to ensure that all personnel having responsibility for the origination, reception, management and/or distribution of aeronautical information and aeronautical data have full access to the relevant ICAO Annexes and Documents, either in up-to-date hard copy form or by arranging internet access through the ICAO Secure Portal.

2.78 The AAITF/9 meeting was reminded of the AIS – AIM Transition Table (**Attachment I**), maintained by AAITF and available on the ICAO Asia/Pacific Regional Office website. Asia/Pacific Administrations had been informed of the table on a number of occasions, and there were several formal requests by the ICAO Regional Office for updated information (most recently, State Letters AP026/14 (ATM) and AP044/14 (ATM)). Since the inception of the AIM Transition Table the following States had provided no information: Bhutan, Brunei Darussalam, Kiribati, Marshall Islands, Micronesia, Nauru, Samoa, and Tonga.

2.79 The Seamless ATM Reporting Form recorded AIM Transition Phase status only in terms of either being completed or not completed. The AIM Transition table provided additional scope for States and Administrations to report their degree of progress towards full implementation of each Transition Step. The progress recorded in the AIM Transition Table was also currently used for Regional Performance Dashboards and the Global Air Navigation Report, both of which provided publicly available information about Regional and State AIM implementation progress. To improve State engagement with AAITF activities and the quality of AIM transition status reporting the following Draft Conclusion was agreed by the ATM/SG/2 for consideration by APANPIRG:

Draft Conclusion ATM/SG/2-12: AIM Transition Reporting

That, considering:

1. the Asia/Pacific Seamless ATM Plan expectation of implementation of Phase 1 and Phase 2 AIS to AIM roadmap transition steps by November 2015;
2. the AAITF Terms of Reference requirement to monitor AIM transition; and
3. the information used for regional and global ATM performance reporting,

States are urged to:

a) verify the information currently recorded in the AIM Implementation Table appended at [**Attachment I]**, and

b) update the information in the AIM Transition Table at least once annually, by April 30 each year.

2.80 APANPIRG/24 and the 50th DGCA Conf. were informed that Air Navigation Deficiencies would be raised against unimplemented Phase 1 and Phase 2 AIM Transition Steps. Taking the expectations of the Seamless ATM Plan and the current status of global AIM implementation guidance material into consideration, AIS-related Air Navigation Deficiencies were raised against Phase 1 AIS-AIM (Consolidation) Transition Steps only. Those relating to Phase 2 Transition Steps would be considered in 2015 and beyond. Four Asia/Pacific States were currently listed in the *APANPIRG Reporting Form on Air Navigation Deficiencies in the ATM Field in the Asia/Pacific* for not fully implementing WGS-84. A further 13 States were added to the form under this item.

2.81 No States were currently listed in the APANPIRG deficiencies reporting form for unimplemented Quality Management Systems. A total of 25 States were added to the form under this item (the full list of ANS deficiencies was presented separately under ATM/SG/2/WP28).

2.82 The Secretariat advised that States could provide new or amended information relating to deficiencies in the period between ATM/SG/2 and the formalization of the deficiency list by APANPIRG/25. It was pointed out that the purpose of raising deficiencies against States was to highlight to the need for attention and necessary resources to be applied to the ANS area concerned.

2.83 An update was provided on the International Codes and Route Designators (ICARD) application and participation by Asia/Pacific States, including discussion of procedural issues related to the allocation of five letter name code (5LNC) waypoint names in flight procedures and ATS routes, and duplicated waypoint names in dangerous proximity.

2.84 APANPIRG Conclusion C21/7 had urged States to register ICARD 5LNC PLANNERS, which was required for allocation of waypoint names to comply with the requirements of Annex 11. The following 16 Administrations had failed to do so: Bhutan, Macao China, Cook Islands, DPRK, Maldives, Marshall Islands, Micronesia, Mongolia, Myanmar, Nauru, Nepal, Palau, Samoa, Solomon Islands, Tonga and Vanuatu.

2.85 When submitting a selected 5LNC Planners were required to conduct a proximity check for <u>like-sounding</u> 5LNC. There had been a significant number of instances where requests for 5LNC indicated that the proximity check has been completed, but a check by the 5LNC MANAGER revealed like-sounding waypoints in proximity to the requested location. Recognizing that assessment of 'like-sounding' should include consideration of the complex aviation communications environment, and the widely varied language background of pilots and air traffic controllers, it was recommended that personnel with appropriate levels of experience in operational air-ground-air communications were utilized to ensure to the maximum extent possible that selected 5LNC could not be confused with other, proximate like-sounding waypoints.

2.86 Recent occurrences suggested that States were allocating 5LNC for use in flight procedure design before the flight procedure had been validated. The process for designing and implementing ATS routes and flight procedures should ensure that the final location of the waypoint was fully validated before requesting the 5LNC in ICARD.

2.87 ICAO had been working to progressively eliminate duplicated 5LNC globally. Duplicate codes were required to be replaced. In collaboration with industry partners ICAO Headquarters had identified Asia/Pacific duplicates that were considered by industry to be dangerously proximate, which are provided in tabular and graphical representation at **Attachment J**. The ATM/SG/2 meeting agreed to the following Draft Conclusion for APANPIRG consideration:

Draft Conclusion ATM/SG/2-13: Duplicated 5LNC

That States take coordinated action to replace duplicated 5LNC as detailed in [**Attachment J]**.

2.88 States were required to notify the ICAO Regional Office of any request for ATS Route designators. The process was laborious and time-consuming for States and the Regional Office, and potentially induced handling errors. The ATS Route Designators allocation function of the ICARD application was not available in to the Asia/Pacific Region. Given the expected increase in requests for new ATS route designators to facilitate airspace capacity and efficiency outcomes and PBN implementation a more appropriate and up-to-date method was needed. The ATM/SG/2 meeting agreed to the following Draft Conclusion for APANPIRG's consideration:

> **Draft Conclusion ATM/SG/2-14: Access to ICARD ATS Route Designators Function**
>
> That, taking into consideration the rising demand for ATS route designators resulting from airspace capacity and efficiency changes and implementation of PBN routes and airspace, ICAO takes steps to provide Asia/Pacific ICARD 5LNC MANAGERS and ICARD 5LNC PLANNERS with access to the ATS Route Designators function of the ICARD application

2.89 It was apparent during the meeting discussions that lack of AIM transition guidance material was causing significant concern. There had been delays in the production of global ICAO guidance material, the most significant being the updated Doc 8126 AIS Manual, the new Doc 9839 Quality Manual and Doc 9991 Training Manual.

2.90 It was noted by the AAITF that any independently developed regional guidance material could risk encouraging States to implement AIM in ways that were either not supported by or running counter to the global guidance that was previously expected in 2013, but was now anticipated in by late 2014. AAITF would continue work on AIM transition guidance material, and four priority AIM transition steps were identified: P-17 – *Quality*, P-16 – *Training*, P18 – *Agreements with data originators*, and P-11 *Electronic AIP*.

Research and Development on Information Management

2.91 Japan provided information on the Mini-Global demonstration, which was an FAA project to collaborate with other ANSPs around the world, in order to exchange air transportation information by using the System-Wide Information Management (SWIM) concept and standardized information exchange models. By participating in this project, primary research and development of the SWIM concept in Japan had been conducted. In this demonstration, semi-live data of practical operations would be shared among the member States, and also the scenario-based standardized message exchange between different member States would be demonstrated.

Volcanic Ash Preparation

2.92 Japan provided a paper on the need to adopt the Air Traffic Management Volcanic Ash Contingency Plan, and implementation of Volcanic Ash Exercises in APAC Region. Although this was a matter for the MET Sub-Group of APANPIRG, the ATM/SG/2 recognised the importance of such planning to minimise the adverse effect on ATM of any volcanic activity.

Meteorology Issues relevant to ATM

2.93 The ATM/SG/2 reviewed the outcomes of the Meteorology/Air Traffic Management (MET/ATM) Seminar 2013 and the Third Meeting of the Meteorological Requirements Task Force (MET/R TF/3, formerly the MET/ATM TF, Bangkok, Thailand, from 26 – 29 November 2013), and the Fourth Meeting of the Meteorological Hazards Task Force (MET/H TF/4, Beijing, China, from 19 – 21 March 2014).

2.94 MET/R TF/3 was apprised on outcomes from the volcanic ash exercise VOLKAM13, involving MET, ATM and operators from Japan, Russian Federation and United States. Recognizing the benefits of such exercises, the following MET/R TF Decision was endorsed by ATM/SG/2:

Decision 3/7 - Volcanic ash exercise in the APAC region

That, the ICAO forwards the relevant discussion outcomes from the MET/ATM Seminar and MET/R TF/3 Meeting to the MET/H TF to assist the development of a volcanic ash contingency exercise elsewhere in the APAC Region, involving MET, ATM and operators, based on the VOLKAM experience and volcanic ash exercises in other parts of the world.

Asia/Pacific SAR Task Force

2.95 The United States recalled that the Asia/Pacific Search and Rescue Task Force (APSAR/TF) was suggested by the ICAO Bangkok Regional Office with the objective of considering the enhancement and improvement of Search and Rescue (SAR) capabilities within the Asia/Pacific Region and adjacent regions. The United States noted that based upon the results from its first two meetings, the APSAR/TF provided a commendable service and valuable outputs for consideration and to the credit of the Asia/Pacific region, more States were participating and sharing information and views on SAR.

2.96 The United States noted that the mystery of Malaysia Airlines flight MH 370 was still unfolding; however, there may be SAR concerns similar to those revealed by other aircraft incidents at sea in recent years, including Air France AF 447 in 2009. Moreover, the global community would benefit by gathering the experiences and lessons learned from this incident before they are forgotten.

2.97 The United States also recognised that the draft Asia/Pacific Search and Rescue Plan would require an extensive effort to finalize its text at the next session of the APSAR/TF, noting that the Plan was already being discussed within ICAO Headquarters, and would greatly enhance and improve SAR capabilities within the Asia/Pacific Region and adjacent regions. They urged Asia/Pacific States to review the Plan and provide their advice to the APSAR/TF or, preferably, participate in the APSAR/TF/3, scheduled for January 2015. Malaysia agreed with the United States that lessons from the MH370 incident needed to be learnt and SAR systems improved as soon as possible.

Asia/Pacific Search and Rescue Task Force Outcomes

2.98 The Second Meeting of the Asia/Pacific Regional Search and Rescue Task Force (APSAR/TF/2, Singapore, 27-31 January 2014) was attended by 37 participants from ICAO Asia/Pacific SAR Administrations, ICAO and the International Maritime Organization (IMO).

2.99 Australia presented information to the APSAR/TF/2 on efforts to improve SAR services within the Africa-Indian Ocean area through the establishment of the AFI SAR Services Integration Task Force (ASSI/TF). The ASSI/TF was established following a Decision by the 7th Meeting of the AFI Planning and Implementation Regional Group (APIRG/17, August 2010). Australia suggested that it could be beneficial for the APSAR/TF and ASSI/TF to collaborate by establishing a formal line of communication or holding a joint Task Force meeting to share experiences.

2.100 The IMO had noted that they had established five 'Regional' Rescue Coordination Centres (RCCs) in Africa based on a sub-regional model in Kenya, South Africa, Nigeria, Monrovia, and Morocco. The RCCs in other States within the sub-regions were termed 'Associated' RCCs. The United States fully supported the concept of sub-regional SAR services. The Secretariat noted the close working relationship between Cambodia, Lao PDR and Viet Nam at a recent SAR Exercise (SAREX), which could form the basis of a future sub-regional collaborative RCC development.

2.101 The APSAR/TF/2 meeting had discussed whether there needed to be a schedule of SAREXs, which were conducted on an ad hoc basis or based on irregular bilateral arrangements. ICAO noted that some SAREX did not actually test the SAR system, but were crash fire exercises.

2.102 Cospas-Sarsat presented the current status of the Cospas-Sarsat System – Cosmicheskaya Sistema Poiska Avariynyhk Sudov (Космическая Система Поиска Аварийных Судов, or 'Space System for the Search of Vessels in Distress) Search And Rescue Satellite-Aided Tracking. The paper provided statistics on System performance and the performance of users of the System, including System operations, space and ground segments, beacons, false alerts and results of Cospas-Sarsat Mission Control Centre (MCC) – SPOC communication tests.

2.103 In 2012, based on preliminary information, Cospas-Sarsat alert data assisted in 634 distress incidents and 2,029 persons were rescued. The use of Personal Locator Beacons (PLBs) increased from 28% of the total SAR events in 2011 to 30% in 2012, while Aircraft Emergency Locator Transmitters (ELTs) false alert rates were higher at 4.9% than those of maritime Emergency Position Indicating Radio Beacon (EPIRB) and PLBs. ELT beacon-registration rates were somewhat lower than the rates for EPIRBs and PLBs, and that efforts should be made to improve ELT beacon-registration rates (in 2012, 65.8% of beacons detected were registered). The ratio of all SAR events (maritime, land and aviation) during 2012 was 48%, 30% and 22% respectively.

2.104 Cospas-Sarsat urged administrations to make use of their free International Beacon Registration Database (IBRD) if they needed such a resource.

2.105 Cospas-Sarsat commented that papers had been presented at past forums on the necessity for PLB registration. The United States stated that some States had a problem with PLBs – which did not fall under an administration such as ICAO for ELTs and IMO for EPIRBs. The meeting noted the increasing miniaturisation of PLBs, even in watches, and that Cospas-Sarsat would send an alert automatically no matter what the source; thus a State had an obligation to act. The IMO was concerned about the possibility of PLBs featuring in watches could swamp the SAR alerting system, and overload RCCs. India suggested that in order to ensure early identification of current owner of Aircraft ELT, the States may consider transferring registration of aircraft ELT as a pre-requisite for the transfer of aircraft registration.

2.106 The APSAR/TF/2 noted that unless there was a worldwide agreement to ban PLBs, it was necessary to urgently address and manage issues of systems capacity and system distribution (such as PLB alerts going to a local police agency). The ATM/SG/2 meeting agreed to the following Draft Conclusions for APANPIRG's consideration:

Draft Conclusion ATM/SG/2-15: Cospas-Sarsat Alert Responses

That, considering the importance of effective Cospas-Sarsat alerting and monitoring supporting the international Search and Rescue (SAR) system, States be urged to:

a) consider becoming formally associated with the Cospas-Sarsat system;

b) provide up-to-date SAR Point of Contact (SPOC) details to Cospas-Sarsat, and respond promptly to SPOC communications tests;

c) promote registration of 406 MHz distress beacons and make use of the free International Beacon Registration Database (IBRD) facility unless the State has its own readily available registration system;

d) support a, simplified, serialised beacon unique identification coding system for next generation beacons;

e) ensure the provision of immediate access by Rescue Coordination Centres (RCCs) to the 406 MHz distress beacon registration data, whether maintained by the State or

the Cospas-Sarsat IBRD; and

f) provide post-alert advisories to Cospas-Sarsat on all alert outcomes as soon as practicable as a performance and system improvement measure.

Draft Conclusion APSAR/TF/2-16: Personal Locator Beacon Regulation

That, considering the development of miniaturised Personal Locator Beacons (PLBs) being increasingly carried on persons, marine vessels and aircraft, the possible overload of alerting systems and RCCs, and the obligation of States to respond to safety alerts, ICAOHQ, in cooperation with the IMO, be urged to consider:

a) registering PLBs, (preferably at the point of sale); and

b) the most efficient and uniform means of directing PLB alerts not originating from marine vessels or aircraft to other appropriate public policing or emergency services.

2.107 Cospas-Sarsat provided an extensive overview of Cospas-Sarsat developments, such as the current Demonstration and Evaluation phase of Medium-altitude Earth Orbit Search and Rescue (MEOSAR) spacecraft payloads, and the specifications for the second generation of Cospas-Sarsat beacons, including potential new features for 406 MHz ELTs, including a Return Link Service (RLS) uplink communications system for compatible distress beacons.

2.108 The Secretariat presented the status of SAR information in the Asia/Pacific Region known to the ICAO Regional Office, including the:

a) SAR Capability Matrix Table (**Attachment K**);

b) List of SAR Agreements; and

c) SAR Agreement Matrix (**Attachment L**).

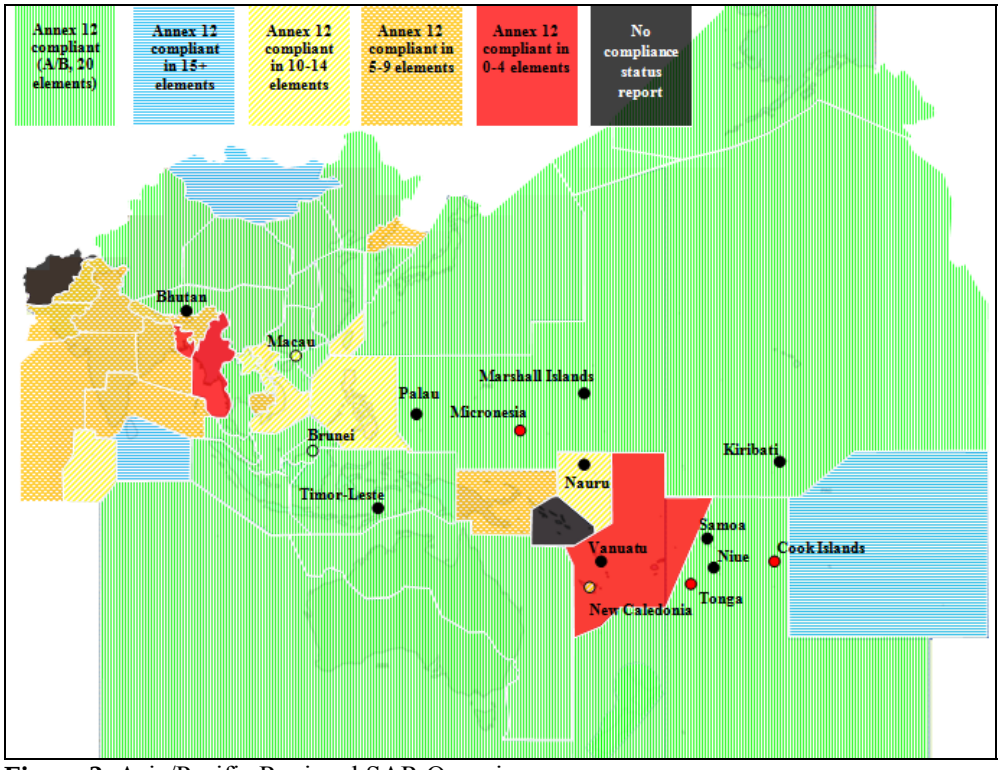

Figure 2: Asia/Pacific Regional SAR Overview

2.109 The regional overview (**Figure 2**) indicated significant Annex 12 compliance weaknesses in South Asia and the Southwest Pacific areas, and some weaknesses in Southeast Asia and the Democratic People's Republic of Korea. Improvements were noted in French Polynesia, Maldives, Mongolia and Sri Lanka since APSAR/TF/1. The United States commended the Regional Office for its work on the regional picture, stressing that honest reporting of status by States was important to ensure changes and resources were made available for SAR improvement.

2.110 The United States noted that ICAO Headquarters Montreal did not have a dedicated SAR technical officer, and that the ICAO/IMO JWG was concerned about this lack of SAR resource. The United States noted that it was appropriate for regional offices to have increased responsibility for SAR within their region, but it was also proper that differences between regions were correctly handled and that there was a focused global oversight. Moreover, they stated that the burden for SAR had shifted to the air traffic management (ATM) section in each regional office; however, this section also normally had a heavy, broad workload. Australia agreed with the intent of the paper, noting that SAR had been left out of the ASBU and supported a dedicated SAR Technical Officer to provide a greater focus on SAR issues at HQ. Singapore supported the idea of a dedicated officer coordinating the global SAR effort. Sri Lanka stated that they were of the view that a permanent SAR officer should be established at ICAOHQ and agreed with the paper, noting the traffic growth in the region.

2.111 The ATM/SG/2 meeting agreed to the following Draft Conclusion for APANPIRG's consideration:

Draft Conclusion ATM/SG/2-17: Global SAR Coordination

That, considering the need for global and inter-regional Search and Rescue (SAR) coordination, ICAOHQ be urged to:

c) review the lack of a dedicated technical officer responsible for managing global SAR policy development and inter-regional coordination; and

d) include SAR as part of the Aviation System Block Upgrades (ASBU).

2.112 The United States announced that it would develop a SAR library on a web site that would be available to other national SAR authorities. Input was requested from the APSAR/TF members to resolve some implementation details, particularly regarding documents specific to the Asia/Pacific region and the structure of the web site. The goal was to provide a site from which any SAR authority could access SAR documents and publications or serve as verification that the RCC/Rescue Sub-Centre (RSC) or SPOC had access to them.

2.113 Documents on the web site would not include those publications which are purchased. Those posted would be what IMO referred to as 'unpublished documents' (non-copyright and thus were available for free). However, consideration would be given to posting extracts of certain IMO and/or ICAO documents, such as large ICAO annexes with only small sections applicable to SAR. The global coordination to support the Library was observed by the meeting as an example of why ICAOHQ SAR oversight was needed. The ATM/SG/2 meeting agreed to the following Draft Decision for APANPIRG's consideration:

Draft Decision ATM/SG/2-18: Search and Rescue (SAR) Library

That, States be urged to utilise the SAR Library located at http://www.uscg.mil/hq/cg5/cg534/SAR_Manuals.asp.

2.114 The APSAR/TF/2 noted that since 2001 the Secretariat of the Pacific Community (SPC), at the behest of regional leaders and those countries with established Search and Rescue Regions (SRRs), had been working to strengthen SAR policy, cooperation and coordination, and more recently to harmonize aeronautical and maritime SAR in the Pacific Islands region. These activities include regional SAR workshops; collection, analysis and dissemination of regional SAR data; and the development of a regional maritime SAR technical arrangement for cooperation under the Technical Arrangement for Cooperation among Pacific Island countries and territories that Support International Lifesaving in the Pacific Ocean (TAfC).

2.115 The meeting discussed coordination between States to improve SAR arrangements through the exchange of lessons learnt and good practices. IATA suggested the concept of SAR 'Go Teams' (normally comprised of experts from International Organizations, the aviation industry and States) used to improve PBN implementation might be applied to SAR. The intention was to up-skill 'champion States' so that improvements could flow to other States. The meeting agreed that it was a useful proposal, and requested the Secretariat to follow up with ICAOHQ on the suggestion.

2.116 The APSAR/TF/2 meeting noted that systems such as satellite tracking systems could be used to supplement the use of ELTs. Cospas-Sarsat noted that they had been compiling information on this problem, which regularly involved antenna detachment. The Cospas-Sarsat Programme was evaluating specification options for a more robust system, including second generation in-flight activation and manufacturer introduction of ELTs with an internal, secondary antenna.

2.117 It had been observed by some APSAR/TF/2 participants that the 50 second delay specified before the first 406 MHz beacon burst may not be appropriate in aviation distress incidents, and that a more 'intelligent' transmission scheduling arrangement might be necessary. The meeting noted that in discussing the requirements for in-flight activation, such requirements should be discussed by airlines, manufacturers, regulators and ANSPs (for possible integration into ATC systems), as well as noting the possible emergence of satellite-based ADS-B which might reduce the need for in-flight activation. New Zealand advised that there had been a request by the aviation industry for light aircraft to use flight tracking instead of ELTs, which they noted appeared to work effectively. Hong Kong, China were concerned that any in-flight activation alert integration into ATC systems would be received by supervisors and not controllers themselves.

2.118 The APSAR/TF/2 noted that the ICAO High Level Safety Conference (HLSC, Montreal, Canada, 29 March-1 April 2010) had agreed that oceanic and remote area SAR required a high priority. Surveillance, flight monitoring, and communications were being considered by expert groups, including the ICAO Flight Recorder Panel (FLIRECP) Working Group, ICAO Operational Data Link Panel (OPLINKP), JWG and Cospas-Sarsat.

2.119 Singapore and the United States presented a regional draft template for a SAR Agreement for consideration by the APSAR/TF/2, before presentation to the JWG.

2.120 Australia presented a list of recommendations for improving a developing State's SAR system derived from an actual gap Analysis of an Asia/Pacific State, including the establishment of a basic Joint Rescue Coordination Centre (JRCC) and JRCC minimum equipment list. These recommendations were provided as an example for consideration during the development of the Asia/Pacific Regional SAR Plan.

2.121 The APSAR/TF/2 reviewed the early draft Asia/Pacific SAR Plan – an outline of the basic document with headings and some starting text. The Plan was expected to be intensively discussed at the APSAR/TF/3 (26-30 January 2015, Maldives) before final presentation to the ATM/SG/3 and APANPIRG/26. An international SAREX was also being planned to be conducted in conjunction with the APSAR/TF/3 meeting.

SAR Activity Sharing of Information using the Internet

2.122 Japan presented information on their SAR coordination system, which was provided in cooperation with five organizations – the Ministry of Defense, Japan Coast Guard, National Police Agency, Fire and Disaster Management Agency and the Japan Civil Aviation Bureau. In order to effectively provide SAR services, a SAR coordination system consisting of a network and computers was developed, with system terminals being available at the headquarters of these organizations. Then the headquarters dispersed information related to SAR activities as appropriate. The SAR coordination system was deployed in 1981 for enhanced RCC services, after the Japan Airlines JL123 accident.

2.123 A new system to more effectively share information between the organizations concerned was planned. The new Internet-based function appeared to be an effective means of sharing information, not just among the State's internal organizations but also for other States participating in an international SAR activity, such as that conducted during the SAR response to the Malaysia Airlines MH 370 event.

MH370 SAR Response – JRCC Australia

2.124 The meeting participants stood for a moment of silence, recognising those lost from the MH370 tragedy. In addition, the meeting acknowledged that the day (07 November 2014) was the formal Official Day of Mourning in Australia for the MH17 downing. ICAO also noted that the United Nations Flag would be lowered to half-mast at UN institutions as a mark of respect for the UNRWA personnel who were killed in Gaza on the same day. Malaysia asked the meeting to place on record its deep appreciation of thanks for the recognition of the tragedies.

2.125 Australia provided a detailed update overview of the Australian SAR response to Malaysia Airlines Flight MH370 which went missing following its departure from Kuala Lumpur, Malaysia, for Beijing, China on 08 March 2014. It also provided a comparison from a SAR perspective between the MH370 incident and the Air France Flight AF447 incident of 2009 and invited States involved in the MH370 incident to consider providing inputs to ICAO for any improvements to the global and regional SAR system.

2.126 Australia noted that an analysis of radar data and subsequent satellite communication (SATCOM) system signalling messages placed the aircraft in the Australian SAR Region (SRR) along an arc in the southern part of the Indian Ocean. This arc was considered to be the location where the aircraft's fuel was exhausted. Numerous challenges presented to the search operation. These included:

a) lack of available and accurate position data about MH370's actual flight;

b) no distress beacon detections (ELT or others carried on board);

c) operations with long transits in remote oceanic areas offshore;

d) 10 days elapsed before the search commenced within the Australian SRR;

e) tropical cyclones and poor weather;

f) lack of availability of ship-borne helicopters to investigate sightings;

g) time required for satellite imagery analysis before tasking SAR assets;

h) multinational civil/military cooperation, coordination and communications issues;

i) pressure from the media and need to present a large amount of information online;

j) large amounts of sea pollution causing difficulty distinguishing possible debris;

k) availability of a detailed description of aircraft cargo and likely floating components;

l) sustaining large logistical requirements such as air search observers, fuel, etc.; and

m) lack of clearly defined division of responsibilities between the search and rescue function (Annex 12) and the air accident investigation search and recovery function (Annex 13).

2.127 On 30 March 2014, the Prime Minister of Australia established the Joint Agency Coordination Centre (JACC) to coordinate the Australian Government's support for the search for MH370. No debris associated with MH370 was identified by the surface search.

2.128 For the 42 days of searching coordinated by JRCC Australia in the Australian SRR search areas there were:

a) 345 flight sorties over 3,177 total flight hours;

b) searches over a cumulative area of 4.7 million km^2;

c) 28 search aircraft used, both civil and military, from Australia, China, Japan, Malaysia, New Zealand, Republic of Korea and USA; and

d) civil and military search vessels used from Australia, China, Malaysia, UK and USA.

2.129 Australia noted in answer to a query that they had successfully managed to deal with the extreme workload over many days because they had developed a number of ad hoc bodies to effectively delegate specific tasks and research work. Australia stated that they were very grateful for the tremendous assistance from the other States and organizations they had received.

2.130 Australia presented a detailed overview of the Underwater Locator Beacon (ULB) detections and the Towed Pinger Locator (TPL) system deployments, noting that the acoustic search was supplemented using sonar buoys dropped by Australian AP-3C aircraft with an ability to detect ULB signals. No acoustic detections considered to be related to ULBs were detected. An independent review of the acoustic signals recorded by the Australian *Ocean Shield* vessel determined the signals were not consistent with the nominal performance standards of the ULB and noted, whilst unlikely, the signals could be consistent with a damaged ULB. Moreover, they noted that the detections from the Chinese vessel *MV Haixun 01* were unlikely to be from MH370 due to seafloor depth, surface noise and the equipment used.

2.131 It was decided that an ocean floor sonar search was in progress. An underwater sonar survey using an autonomous underwater vehicle (AUV) started on 14 April 2014 with 30 missions completed searching an area of 860 km^2 with nil debris or wreckage detected. Further work was being conducted to determine the likely source of the *Ocean Shield* acoustic detections. Further collaborative work has continued to refine the analysis of both the flight and satellite data by an international team of specialists from the UK, USA and Australia working both independently.

2.132 A priority area of approximately 60,000 km2 had been derived (which was subject to search from Day 21 to Day 26). Bathymetry analysis of the ocean floor in areas of this search zone commenced in mid-May. An intensified deep-water search was planned to commence in August 2014 for a period of up to 12 months.

2.133 The ATM/SG/2 recalled that the search for Air France Flight AF447 which crashed into the Atlantic Ocean in 2009 was of a significant scale and presented many challenges. During the search operation for MH370, Australia had taken note of the valuable experience, lessons learned and recommendations provided in regard to AF447. The MH370 incident was a scenario not previously experienced by the global SAR community, and it was a highly valuable opportunity to the global SAR community to not only share the experiences and any lessons learned from all the States involved in the SAR response, but to also improve the existing SAR system where appropriate.

2.134 Australia noted that Annex 12, Search and Rescue, Recommendation 5.9.2 reiterated that RCCs should prepare appraisals of actual SAR operations, and submit these to ICAO for information and dissemination as appropriate. The MH370 operation was continuing and pending investigation, so States who were involved in the recovery effort may not yet be in a position to collate lessons learned and opportunities for improvement. Notwithstanding this, any useful lessons that are already self-evident should be discussed to urgently improve SAR systems where possible and enhance the Asia/Pacific SAR Plan before its completion.

2.135 In that regard, ICAO outlined a number of discussion issues as follows that the MH370 event had highlighted, which needed to be discussed by the APSAR/TF and possibly incorporated into the Asia/Pacific SAR Plan and/or global SAR material.

a) CIVIL/MILITARY: It was apparent that a higher degree of civil/military coordination may have revealed the possibility of the MH370 course reversal much earlier after the initial alert advice from Viet Nam ATC, and saved as much as a week of fruitless searching in the wrong area, while reducing the chances of finding the ULB given its limited battery life.

b) SAR PHASES: The time lapses of more than 16 minutes between the transfer of control point at IGARI and the advisory to Kuala Lumpur ACC that MH370 had disappeared, 38 minutes for the issuance of an INCERFA SAR phase, and 7 hours and 21 minutes for the issuance of an ALERFA/DETRESFA SAR phases indicated that the Annex 12 SAR phases and actions may need to be revised to take into account the expectations and capabilities of a modern ATS surveillance environment (the SAR phases were designed in a procedural environment). The SAR actions should include the need for civil/military coordination where appropriate, and advisories to <u>all</u> neighbouring ACCs in the case of uncertainty of the aircraft's track.

c) SAR PREPAREDNESS: Poor SAR preparedness and ad hoc SAR coordination between States needed to be addressed. Past APANPIRG Conclusions meant to address SAR coordination weaknesses had been largely ignored. In some cases SAR Agreements were hindered by political barriers whereby States can take many years to progress documents through government ministries. This may require a high level political agreement to change the manner in which SAR agreements and operational coordination is prioritized and managed. In addition, the region needs to conduct properly organized SAREX that actually test the SAR system on a regular basis and report the outcomes to APANPIRG, instead of this being done on an ad hoc basis between States.

d) ANNEX 12/13 TRANSITION: Annex 12 and Annex 13 needed to be updated to include SARPs on transition procedures between the two Annexes, particularly regarding who is responsible during concurrent Annex 12 and Annex 13 activities (i.e.: who is responsible for a rescue operation and when that phase ends, so it became primarily a recovery/investigation operation under Annex 13).

e) MULTIPLE SRRS/FIRS: Annex 12 had no reference in paragraph 5.2.4 as to responsibility when more than two SRRs were involved, especially if the airspace concerned was not part of the original flight plan.

f) SRR DESIGNATION Aeronautical SRR designation by States (as it is written in Annex 12 at present) instead of the ICAO Council was not the most optimal method, and did not align with the process used to designate FIRs; thus there were areas where there was an overlap of SAR responsibility or no clear responsibility.

2.136 The ATM/SG/2 meeting agreed that there was a need to emphasise the importance of civil/military cooperation in respect of SAR information and response. ICAO noted that this would be highlighted at the upcoming Civil/Military Seminar (Regional Sub-Office, Beijing, 12-14 November 2014) and incorporated into the draft Asia/Pacific SAR Plan.

Efficient SAR Actions – Review of Annex 11 Provisions

2.137 India recalled the Annex 11 and 12 SAR alerting phases, stressing that the primary objective of the SAR actions was to organize and extend timely assistance to the aircraft in a state of emergency and averting a situation that might lead to human lives being endangered.

2.138 India noted that duration of 30 minutes in the 'Uncertainty phase' was primarily to try to establish communication with the aircraft by various means and ascertain its position and status. This loss of valuable time was all the more critical in airspace with ATS surveillance, where it was more evident that there was a problem. It is therefore considered necessary that the Annex 11 provisions on 'Uncertainty phase' and 'Alert phase' should be reviewed to reduce the timeframe and associated SAR actions would be initiated in an expeditious and pro-active manner without losing valuable time. India suggested that it may be appropriate to combine both uncertainty and alert phase with objective-oriented measures and a sequence of actions aimed at expeditiously ascertaining the situation and swiftly initiating Search and Rescue missions.

2.139 IATA advised that they supported a reduction in the SAR response timeframe as suggested by India, but also noted that they would be concerned if a mandate for SATCOM was being considered. The meeting congratulated India for the excellent paper, noting its valuable suggestions and correlation with other submissions in regard to the SAR phases.

2.140 Considering the content of WP25, WP27, WP30, WP33 and Flimsy 1, the ATM/SG/2 agreed to the following Draft Conclusion, for consideration by APANPIRG:

Draft Conclusion ATM/SG/2-19: Provision of MH370 Feedback

In accordance with Annex 12, Recommendation 5.9.2, that:

a) Asia/Pacific States/Administrations involved in the SAR response to MH370 be urged to develop any lessons learned and suggestions for improvement for submission to the APSAR/TF/3 meeting, scheduled for 26-30 January 2015; and

b) ICAO and IMO be urged to consider lessons learned and feedback in order to update global SAR standards and guidance material.

Search and Rescue Cooperation and Coordination

2.141 The United States provided a paper on the need to enhance SAR cooperation and coordination, noting that this was consistent with a near-term conclusion from the Special Meeting on Global Flight Tracking (Montreal, 12-13 May 2014). The paper recognised that the ICAO Bangkok Regional Office had already begun effort to address this concern, particularly with its Asia/Pacific SAR Task Force (APSAR/TF), and the experience gained in response to the disappearance of Malaysia flight MH 370 would likely create new questions for SAR authorities to consider in this area. The paper provided a list of possible improvement elements that would be considered by the APSAR/TF/3 meeting in developing the Asia/Pacific Regional SAR Plan.

Air Navigation Service Deficiencies List

2.142 The meeting reviewed and discussed the ATM/AIS/SAR Deficiency List included as **Appendix M**. The meeting agreed to the following Draft Conclusion for consideration by APANPIRG (which included the AOPWG Deficiencies under Agenda Item 3.1, **Appendix X**):

Draft Conclusion ATM/SG/2-20: ATM Deficiency List

That, the list of air navigation deficiencies reported and identified in [**Appendix M** and **Appendix X] of this Report** be updated to the APANPIRG air navigation deficiencies list.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) note the endorsement of RAMAG/19 Draft Conclusions (paragraph 2.3);

c) note the endorsement or comment on CNS/SG/18 Draft Conclusions and Decisions (paragraph 2.7 and 2.19);

d) endorse the concept of performance-based airspace (not the detail in the draft PfAs which will be circulated for comment by State Letter, paragraph 2.14);

e) discuss and agree to Draft Decision ATM/SG/2-1: ATFM/SG Terms of Reference (paragraph 2.29);

f) discuss and agree to Draft Conclusion ATM/SG/2-2: Human Performance Initiatives (paragraph 2.37); and

g) discuss and agree to Draft Decision ATM/SG/2-3: Amend RACP/TF Terms of Reference (Paragraph 2.48); and

h) discuss and agree to Decision ATM/SG/2-4: Ad Hoc Afghanistan Contingency Group (paragraph 2.55); and

i) discuss and agree to Draft Conclusion ATM/SG/2-5: ATS Route Catalogue Version 13 (paragraph 2.67); and

j) discuss and agree to Draft Conclusion ATM/SG/2-11: Access to ICAO Annexes and Documents (paragraph 2.77); and

k) discuss and agree to Draft Conclusion ATM/SG/2-12: AIM Transition Reporting (paragraph 2.79); and

l) discuss and agree to Draft Conclusion ATM/SG/2-13: Duplicated 5LNC (paragraph 2.87); and

m) discuss and agree to Draft Conclusion ATM/SG/2-14: Access to ICARD ATS Route Designators Function (paragraph 2.88); and

n) discuss and agree to Draft Conclusion ATM/SG/2-15: Cospas-Sarsat Alert Responses (paragraph 2.104); and

o) discuss and agree to Draft Conclusion APSAR/TF/2-16: Personal Locator Beacon Regulation (paragraph 2.104); and

p) discuss and agree to Draft Conclusion ATM/SG/2-17: Global SAR Coordination (paragraph 2.109); and

q) discuss and agree to Draft Decision ATM/SG/2-18: Search and Rescue (SAR) Library (paragraph 2.111); and

r) discuss and agree to Draft Conclusion ATM/SG/2-19: Provision of MH370 Feedback (paragraph 2.138); and

s) discuss and agree to Draft Conclusion ATM/SG/2-20: ATM Deficiency List (paragraph 2.140); and

t) discuss any other relevant matters as appropriate.

…….

Proposal for Amendment of
Regional Supplementary Procedures ICAO Doc 7030/3
(Serial No. APAC-S 14/07 – MID/ASIA/PAC)

a) **Regional Supplementary Procedures, Doc 7030/3:** MID/ASIA and PAC

b) **Proposing State:**

c) **Proposed Amendment:**

1. On page MID/ASIA 3-2 dated 25/08/09

Insert the following text on 3.3.1:

3.3 Controller-Pilot Data Link Communications (CPDLC)

3.3.1 With the exception of state aircraft, all aircraft operating within the following FIRs shall carry CPDLC equipment within designated portions of airspace and the conditions mandated by the State with responsibility for the FIR concerned: Auckland Oceanic, Bangkok, Beijing, Brisbane, Chennai, Colombo, Delhi, Dhaka, Fukuoka, Guangzhou, Hanoi, Ho Chi Minh, Honiara, Hong Kong, Incheon, Jakarta, Kabul, Karachi, Kathmandu, Kolkata, Kota Kinabalu, Kuala Lumpur, Kunming, Lahore, Lanzhou, Male, Manila, Melbourne, Mumbai, Nauru, Phnom Penh, Port Moresby, Pyongyang, Sanya, Shanghai, Shenyang, Singapore, Taibei, Ujung Pandang, Ulan Bator, Urumqi, Vientiane, Wuhan, Yangon.

3.3.2 The portions of airspace referred to in 3.3.1 may only be designated under the following circumstances:

a) a safety or performance benefit is clearly defined;

b) appropriate prior consultation with affected airspace users and affected Air Traffic Control (ATC) units has been undertaken;

c) conduct of a safety case, which includes, *inter alia*, a human factors review and the integration of data into the ATC workstation;

d) appropriate pilot and ATC training;

e) promulgation of the airspace mandate with appropriate notice, and in accordance with the provisions of Annex 15.

2. On page PAC 3-2 dated 30/11/07

Insert the following text on 3.3.1:

3.3 Controller-Pilot Data Link Communications (CPDLC)

3.3.1 With the exception of state aircraft, all aircraft operating within the following FIRs shall carry CPDLC equipment within designated portions of airspace and the conditions mandated by the State with responsibility for the FIR concerned: Anchorage Oceanic, Auckland Oceanic, Nadi, Tahiti.

3.3.2 The portions of airspace referred to in 3.3.1 may only be designated under the following circumstances:

a) a safety or performance benefit is clearly defined;

b) appropriate prior consultation with affected airspace users and affected Air Traffic Control (ATC) units has been undertaken;

c) conduct of a safety case, which includes, *inter alia*, a human factors review and the integration of data into the ATC workstation;

d) appropriate pilot and ATC training;

e) promulgation of the airspace mandate with appropriate notice, and in accordance with the provisions of Annex 15.

d) **Proposers' Reasons for Amendment:**

Since 2011, the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) has agreed to a number of Conclusions designed to facilitate the enhancement of Air Navigation Services (ANS) within performance-based airspace. In essence, APANPIRG endorsed the concept of airspace mandates to improve the safety and efficiency of airspace, as long as there was appropriate consultation and a performance benefit to airspace users. The development of the Seamless ATM Plan in 2013 was the main mechanism for States to improve ANS and airspace performance on a region-wide basis. The Conclusions are as follows:

APANPIRG/23 (2012)

Conclusion 23/5 – Asia/Pacific Air Navigation Concept of Operations Mandates

That, States intending to implement Performance-Based Navigation and Safety Nets may, after appropriate consultation with airspace users, designate portions of airspace within their area of responsibility:
a) as providing priority for access to such airspace for

aircraft with prescribed Performance-Based Navigation (PBN) specifications and supporting data-link equipage (ADS-C/CPDLC); and/or
b) mandating the carriage and use of an operable Automatic Dependent Surveillance-Contract/ Controller Pilot Data-link Communications Systems (ADS-C/CPDLC) system, and mode A/C and/or mode S transponder.

While it is recognised that States may introduce restrictions and performance-based measures over their sovereign territory, mandates over the High Seas need to be implemented in line with regional air navigation agreements; in this case through APANPIRG. Thus it is necessary to introduce an amendment to the Regional Supplementary Procedures (ICAO Doc 7030) for Asia/Pacific FIRs that allows States to designate portions of performance-based airspace when they are able to provide the performance benefit and in accordance with aircraft equipage and capability.

The level of ANS capability and aircraft equipage varies throughout the Asia/Pacific, so it is intended that States will designate airspace when possible, in either exclusive or 'non-exclusive' (mixed mode with lower priority for non-equipped aircraft), as appropriate.

e) **Proposed Implementation Date of the Amendment**

Upon approval of the Council

f) **Proposal Circulated to the Following States and International Organizations:**

Afghanistan
Australia
Bangladesh
Brunei Darussalam
Cambodia
China
(cc: Hong Kong, China)
(cc: Macao, China)
Cook Islands
Democratic People's Republic of Korea
Fiji
France
Indonesia
Japan
Kiribati
Lao People's Democratic Republic
Malaysia
Maldives
Marshall Islands
Micronesia, Federated States of
Mongolia
Myanmar
Nauru
New Zealand
Palau, Republic of
Papua New Guinea
Philippines
Republic of Korea
Samoa
Singapore
Solomon Islands
Sri Lanka
Thailand
Timor-Leste
Tonga
United States
Vanuatu
Viet Nam
IATA
IFALPA
IFATCA

g) **Secretariat Comments:** This Doc 7030 amendment proposal in respect of CPDLC, together with amendment proposals APAC-S 14/08 and 14/09 for MID/ASIA and PAC Regions, provides a framework for the state to establish performance based airspace, with consideration of such matters as existing and proposed airspace user equipages, mandate timing, definition of airspace volumes (both vertical and horizontal), exclusive or non-exclusive application, exemption provisions and management of State aircraft.

The amendment is specifically intended to enable States to promulgate airspace mandates over the High Seas, and to encourage a regional approach to the establishment of such mandates, where it is appropriate to do so and recognizing that it is not practical for the Asia/Pacific Region to establish Sub-Regional or Region-wide simultaneous mandates. This is in accordance with the concept of the Seamless ATM and performance-based approaches, as well as the Aviation System Block Upgrade (ASBU) initiative and Global Air Traffic Management Operational Concept (ICAO Doc 9854).

Proposal for Amendment of
Regional Supplementary Procedures ICAO Doc 7030/4
(Serial No. APAC-S 14/08 – MID/ASIA/PAC)

a) **Regional Supplementary Procedures, Doc 7030/4:** MID/ASIA/PAC

b) **Proposing State:**

c) **Proposed Amendment:** 1. On page MID/ASIA 4-2 dated 27/03/12

Delete the following text using strikeout on 4.1.1.5.1:

~~4.1.1.5.1 RNP 12.6~~

~~*Area of applicability*~~
~~4.1.1.5.1.1 For flights on controlled oceanic routes across the Tasman Sea within the Auckland Oceanic, Brisbane, Melbourne and New Zealand FIRs and for flights across the South China Sea within Bangkok, Hanoi, Ho Chi Minh, Hong Kong, Kota Kinabalu, Kuala Lumpur, Manila, Taipei and Singapore FIRs, the minimum lateral separation shall be 110 km (60 NM).~~

~~*Means of compliance*~~
~~4.1.1.5.1.2 For application of 4.1.1.5.1.1, aircraft must be RNAV-equipped and RNAV-approved using inertial navigation systems (INS) provided that:~~

~~a) the INS is updated at least every 4.5 hours;~~
~~b) the standard deviation of lateral track errors shall be less than 11.7 km (6.3 NM);~~
~~c) the proportion of the total flight time spent by aircraft 55.5 km (30 NM) or more off the cleared track shall be less than 5.3×10^{-4}; and~~
~~d) the proportion of the total flight time spent by aircraft between 93 and 130 km (50 and 70 NM) off the cleared track shall be less than 13×10^{-5}~~

~~Such navigation performance capability shall be verified by the State of Registry or the State of the Operator, as appropriate. Lateral separation of 185 km (100 NM), or greater if required, shall be used if the track-keeping capability of the aircraft has been reduced for any reason.~~

~~*Note.— The navigation performance accuracy contained in b) is considered to be comparable to RNP 12.6 or better.*~~

~~4.1.1.5.1.3 When granting approval for operations as indicated in 4.1.1.5.1.1, either the State of Registry or the State of the Operator shall ensure that in-flight operating drills include mandatory navigation cross-checking procedures which will identify navigation errors in sufficient time to prevent the aircraft from inadvertently deviating from the ATC-cleared route.~~

2. On page MID/ASIA 4-4 dated 27/03/12

Insert the following text on 4.1.3:

4.1.3 PBN Airspace Mandates

4.1.3.1 With the exception of state aircraft, all aircraft operating within the following FIRs shall be approved by the State of Registry (or the State of the Operator as appropriate) to PBN navigation specifications within designated portions of airspace and the conditions mandated by the State with responsibility for the FIR concerned: Auckland Oceanic, Bangkok, Beijing, Brisbane, Chennai, Colombo, Delhi, Dhaka, Fukuoka, Guangzhou, Hanoi, Ho Chi Minh, Honiara, Hong Kong, Incheon, Jakarta, Kabul, Karachi, Kathmandu, Kolkata, Kota Kinabalu, Kuala Lumpur, Kunming, Lahore, Lanzhou, Male, Manila, Melbourne, Mumbai, Nauru, Phnom Penh, Port Moresby, Pyongyang, Sanya, Shanghai, Shenyang, Singapore, Taibei, Ujung Pandang, Ulan Bator, Urumqi, Vientiane, Wuhan, Yangon.

4.1.3.2 The portions of airspace referred to in 4.1.3.2 may only be designated under the following circumstances:

a) a safety or performance benefit is clearly defined

b) appropriate prior consultation with affected airspace users and affected Air Traffic Control (ATC) units has been undertaken;

c) conduct of a safety case, which includes, *inter alia*, a human factors review and the integration of data into the ATC workstation;

d) appropriate pilot and ATC training;

e) promulgation of the airspace mandate with appropriate notice, and in accordance with the provisions of Annex 15.

3. On page PAC 4 – 3 dated 30/11/07

Insert the following text on 4.1.3:

4.1.3 PBN Airspace Mandates

4.1.3.1 With the exception of state aircraft, all aircraft operating within the following FIRs shall be approved by the State of Registry (or the State of the Operator as appropriate) to PBN navigation specifications within designated portions of airspace and the conditions mandated by the State with responsibility for the FIR concerned: Anchorage Oceanic, Auckland Oceanic, Nadi, Tahiti.

4.1.3.2 The portions of airspace referred to in 4.1.3.1 may only be designated under the following circumstances:

a) a safety or performance benefit is clearly defined;

b) appropriate prior consultation with affected airspace users and affected Air Traffic Control (ATC) units has been undertaken;

c) conduct of a safety case, which includes, *inter alia*, a human factors review and the integration of data into the ATC workstation;

d appropriate pilot and ATC training;

e) promulgation of the airspace mandate with appropriate notice, and in accordance with the provisions of Annex 15.

d) **Proposers' Reasons for Amendment:**

The existing section 4.1.1.5.1 refers only to RNP 12.6, which is a redundant RNP standard, no longer in use.

Since 2011, the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) has agreed to a number of Conclusions designed to facilitate the enhancement of Air Navigation Services (ANS) within performance-based airspace. In essence, APANPIRG endorsed the concept of airspace mandates to improve the safety and efficiency of airspace, as long as there was appropriate consultation and a performance benefit to airspace users. The development of the Seamless ATM Plan in 2013 was the main mechanism for States to improve ANS and airspace performance on a region-wide basis. The Conclusions are as follows:

APANPIRG/24 (2013)

Conclusion 24/39 - Asia/Pacific Regional PBN Implementation Plan Ver. 4
That, recognizing the need for alignment of PBN Strategies and Guidance Material, as well as development of the Asia/Pacific Seamless ATM Plan, the Asia/Pacific Regional PBN Implementation Plan Version 4.0, provided in **Appendix F** to the Report on Agenda Item 3.4 be adopted.

While it is recognised that States may introduce restrictions and performance-based measures over their sovereign territory, mandates over the High Seas need to be implemented in line with regional air navigation agreements; in this case through APANPIRG. Thus it is necessary to introduce an amendment to the Regional Supplementary Procedures (ICAO Doc 7030) for Asia/Pacific FIRs that allows States to designate portions of performance-based airspace when they are able to provide the performance benefit and in accordance with aircraft equipage and capability.

The level of ANS capability and aircraft equipage varies throughout the Asia/Pacific, so it is intended that States will designate airspace when possible, in either exclusive or 'non-exclusive' (mixed mode with lower priority for non-equipped aircraft), as appropriate.

e) **Proposed Implementation Date of the Amendment**

Upon approval of the Council

f) **Proposal Circulated to the Following States and International Organizations:**

Afghanistan
Australia
Bangladesh
Brunei Darussalam
Cambodia
China
(cc: Hong Kong, China)
(cc: Macao, China)
Cook Islands
Democratic People's Republic of Korea
Fiji
France
Indonesia
Japan
Kiribati
Lao People's Democratic Republic
Malaysia
Maldives
Marshall Islands
Micronesia, Federated States of
Mongolia
Myanmar
Nauru
New Zealand
Palau, Republic of
Papua New Guinea
Philippines
Republic of Korea
Samoa
Singapore
Solomon Islands
Sri Lanka
Thailand
Timor-Leste
Tonga
United States
Vanuatu
Viet Nam
IATA
IFALPA
IFATCA

g) **Secretariat Comments:**

This Doc 7030 amendment proposal in respect of PBN, together with amendment proposals APAC-S 14/07 and 14/09 for MID/ASIA and PAC Regions, provides a framework for the state to establish performance based airspace, with consideration of such matters as existing and proposed airspace user equipages, mandate timing, definition of airspace volumes (both vertical and horizontal), exclusive or non-exclusive application, exemption provisions and management of State aircraft.

The amendment is specifically intended to enable States to

promulgate airspace mandates over the High Seas, and to encourage a regional approach to the establishment of such mandates, where it is appropriate to do so and recognizing that it is not practical for the Asia/Pacific Region to establish Sub-Regional or Region-wide simultaneous mandates. This is in accordance with the concept of the Seamless ATM and performance-based approaches, as well as the Aviation System Block Upgrade (ASBU) initiative and Global Air Traffic Management Operational Concept (ICAO Doc 9854).

Proposal for Amendment of
Regional Supplementary Procedures ICAO Doc 7030/5
(Serial No. APAC-S 14/09 – MID/ASIA/PAC)

a) **Regional Supplementary Procedures, Doc 7030/5:** MID/ASIA and PAC

b) **Proposing State:**

c) **Proposed Amendment:** 1. On page MID/ASIA 5-2 dated 30/11/07

5.2.1 Carriage and operation of SSR Mode S

Insert the following text on 5.2.1.1:

5.2.1.1 With the exception of state aircraft, all aircraft operating within the following FIRs shall carry SSR Mode S equipment within designated portions of airspace and the conditions mandated by the State with responsibility for the FIR concerned: Auckland Oceanic, Bangkok, Beijing, Brisbane, Chennai, Colombo, Delhi, Dhaka, Fukuoka, Guangzhou, Hanoi, Ho Chi Minh, Honiara, Hong Kong, Incheon, Jakarta, Kabul, Karachi, Kathmandu, Kolkata, Kota Kinabalu, Kuala Lumpur, Kunming, Lahore, Lanzhou, Male, Manila, Melbourne, Mumbai, Nauru, Phnom Penh, Port Moresby, Pyongyang, Sanya, Shanghai, Shenyang, Singapore, Taibei, Ujung Pandang, Ulan Bator, Urumqi, Vientiane, Wuhan, Yangon.

5.2.1.2 The portions of airspace referred to in 5.2.1.1 may only be designated under the following circumstances:

a) a safety or performance benefit is clearly defined;

b) appropriate prior consultation with affected airspace users and affected Air Traffic Control (ATC) units has been undertaken;

c) conduct of a safety case, which includes, *inter alia*, a human factors review and the integration of data into the ATC workstation;

d) appropriate pilot and ATC training;

e) promulgation of the airspace mandate with appropriate notice, and in accordance with the provisions of Annex 15.

2. On page PAC 5-2 dated 30/11/07

Insert the following text on 5.2.1.1:

5.2.1 Carriage and operation of SSR Mode S

5.2.1.1 With the exception of state aircraft, all aircraft operating within the following FIRs shall carry SSR Mode S equipment within designated portions of airspace and the conditions mandated by the State with responsibility for the FIR concerned: Anchorage Oceanic, Auckland Oceanic, Nadi, Tahiti.

5.2.1.2 The portions of airspace referred to in 5.2.1.1 may only be designated under the following circumstances:

a) a safety or performance benefit is clearly defined;

b) appropriate prior consultation with affected airspace users and affected Air Traffic Control (ATC) units has been undertaken;

c) conduct of a safety case, which includes, *inter alia*, a human factors review and the integration of data into the ATC workstation;

d) appropriate pilot and ATC training;

e) promulgation of the airspace mandate with appropriate notice, and in accordance with the provisions of Annex 15.

3. On page MID/ASIA 5-2 dated 30/11/07

5.3.1 Carriage and operation of ACAS II

Insert the following text on 5.3.1.1:

5.3.1.1 With the exception of state aircraft, all aircraft operating within the following FIRs shall carry ACAS II equipment within designated portions of airspace and the conditions mandated by the State with responsibility for the FIR concerned: Auckland Oceanic, Bangkok, Beijing, Brisbane, Chennai, Colombo, Dhaka, Delhi, Fukuoka, Guangzhou, Hanoi, Ho Chi Minh, Honiara, Hong Kong, Incheon, Jakarta, Kabul, Karachi, Kathmandu, Kota Kinabalu, Kolkata, Kuala Lumpur, Kunming, Lahore, Lanzhou, Male, Manila, Melbourne, Mumbai, Nauru, Phnom Penh, Port Moresby, Pyongyang, Sanya, Shanghai, Shenyang, Singapore, Urumqi, Wuhan, Taibei, Ujung Pandang, Vientiane, Ulan Bator, Yangon.

5.3.1.2 The portions of airspace referred to in 5.3.1.1 may only be designated under the following circumstances:

a) a safety or performance benefit is clearly defined;

b) appropriate prior consultation with affected

airspace users and affected Air Traffic Control (ATC) units has been undertaken;

c) conduct of a safety case, which includes, *inter alia*, a human factors review and the integration of data into the ATC workstation;

d) appropriate pilot and ATC training;

e) promulgation of the airspace mandate with appropriate notice, and in accordance with the provisions of Annex 15.

4. On page PAC 5-2 dated 30/11/07

5.3.1 Carriage and operation of ACAS II

Insert the following text on 5.3.1.1:

5.3.1.1 With the exception of state aircraft, all aircraft operating within the following FIRs shall carry ACAS II equipment within designated portions of airspace and the conditions mandated by the State with responsibility for the FIR concerned: Anchorage Oceanic, Auckland Oceanic, Auckland Oceanic, Nadi, Tahiti.

5.3.1.2 The portions of airspace referred to in 5.3.1.1 may only be designated under the following circumstances:

a) a safety or performance benefit is clearly defined;

b) appropriate consultation with affected airspace users and affected Air Traffic Control (ATC) units has been undertaken;

c) conduct of a safety case, which includes, *inter alia*, a human factors review and the integration of data into the ATC workstation;

d) appropriate pilot and ATC training;

e) promulgation of the airspace mandate with appropriate notice, and in accordance with the provisions of Annex 15.

5. On page MID/ASIA 5-3 dated 30/11/07

5.4 Automatic Dependent Surveillance – Contract (ADS–C)

Insert the following text on 5.4.1:

5.4.1 Carriage and operation of ADS–C

5.4.1.1 With the exception of state aircraft, all aircraft operating within the following FIRs shall carry ADS – C equipment within designated portions of airspace and the conditions mandated by the State with responsibility for the FIR concerned: Auckland Oceanic, Bangkok, Beijing, Brisbane, Chennai, Colombo, Delhi, Dhaka, Fukuoka, Guangzhou, Hanoi, Ho Chi Minh, Honiara, Hong Kong, Incheon, Jakarta, Kabul, Karachi, Kathmandu, Kolkata, Kota Kinabalu, Kuala Lumpur, Kunming, Lahore, Lanzhou, Male, Manila, Melbourne, Mumbai, Nauru, Phnom Penh, Port Moresby, Pyongyang, Sanya, Shanghai, Shenyang, Singapore, Taibei, Ujung Pandang, Ulan Bator, Urumqi, Vientiane, Wuhan, Yangon.

5.4.1.2 The portions of airspace referred to in 5.4.1.1 may only be designated under the following circumstances:

a) a safety or performance benefit is clearly defined;

b) appropriate prior consultation with affected airspace users and affected Air Traffic Control (ATC) units has been undertaken;

c) conduct of a safety case, which includes, *inter alia*, a human factors review and the integration of data into the ATC workstation;

d) appropriate pilot and ATC training;

e) promulgation of the airspace mandate with appropriate notice, and in accordance with the provisions of Annex 15.

6. On page PAC 5-3 dated 30/11/07

5.4 Automatic Dependent Surveillance – Contract (ADS–C)

Insert the following text on 5.4.1:

5.4.1 Carriage and operation of ADS–C

5.4.1.1 With the exception of state aircraft, all aircraft operating within the following FIRs shall carry ADS–C equipment within designated portions of airspace and the conditions mandated by the State with responsibility for the FIR concerned: Anchorage Oceanic, Auckland Oceanic, Nadi, Tahiti.

5.4.1.2 The portions of airspace referred to in 5.4.1.1 may only be designated under the following circumstances:

a) a safety or performance benefit is clearly defined;

b) appropriate consultation with affected airspace users and affected Air Traffic Control (ATC) units has been undertaken;

c) conduct of a safety case, which includes, *inter alia*, a human factors review and the integration of data into the ATC workstation;

d) appropriate pilot and ATC training;

e) promulgation of the airspace mandate with appropriate notice, and in accordance with the provisions of Annex 15.

7. On page MID/ASIA 5-3 dated 30/11/07

5.5 Automatic Dependent Surveillance – Broadcast (ADS–B)

Insert the following text on 5.5.1:

5.5.1 Carriage and operation of ADS–B OUT

5.5.1.1 With the exception of state aircraft, all aircraft operating within the following FIRs shall carry ADS–B OUT equipment within designated portions of airspace and the conditions mandated by the State with responsibility for the FIR concerned: Auckland Oceanic, Bangkok, Beijing, Brisbane, Chennai, Colombo, Delhi, Dhaka, Fukuoka, Guangzhou, Hanoi, Ho Chi Minh, Honiara, Hong Kong, Incheon, Jakarta, Kabul, Karachi, Kathmandu, Kolkata, Kota Kinabalu, Kuala Lumpur, Kunming, Lahore, Lanzhou, Male, Manila, Melbourne, Mumbai, Nauru, Phnom Penh, Port Moresby, Pyongyang, Sanya, Shanghai, Shenyang, Singapore, Taibei, Ujung Pandang, Ulan Bator, Urumqi, Vientiane, Wuhan, Yangon.

5.5.1.2 The portions of airspace referred to in 5.5.1.1 may only be designated under the following circumstances:

a) a safety or performance benefit is clearly defined;

b) appropriate prior consultation with affected airspace users and affected Air Traffic Control (ATC) units has been undertaken;

c) conduct of a safety case, which includes, *inter alia*, a human factors review and the integration of data into the ATC workstation;

d) appropriate pilot and ATC training;

e) promulgation of the airspace mandate with

appropriate notice, and in accordance with the provisions of Annex 15.

8. On page PAC 5-3 dated 30/11/07

5.5 Automatic Dependent Surveillance – Contract (ADS–B)

Insert the following text on 5.5.1:

5.5.1 Carriage and operation of ADS–B OUT

5.5.1.1 With the exception of state aircraft, all aircraft operating within the following FIRs shall carry ADS–B OUT equipment within designated portions of airspace and the conditions mandated by the State with responsibility for the FIR concerned: Anchorage Oceanic, Auckland Oceanic, Nadi, Tahiti.

5.5.1.2 The portions of airspace referred to in 5.5.1.1 may only be designated under the following circumstances:

a) a safety or performance benefit is clearly defined;

b) appropriate prior consultation with affected airspace users and affected Air Traffic Control (ATC) units has been undertaken;

c) conduct of a safety case, which includes, *inter alia*, a human factors review and the integration of data into the ATC workstation;

d) appropriate pilot and ATC training;

e) promulgation of the airspace mandate with appropriate notice, and in accordance with the provisions of Annex 15.

d) **Proposers' Reasons for Amendment:**

Since 2011, the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) has agreed to a number of Conclusions designed to facilitate the enhancement of Air Navigation Services (ANS) within performance-based airspace. In essence, APANPIRG endorsed the concept of airspace mandates to improve the safety and efficiency of airspace, as long as there was appropriate consultation and a performance benefit to airspace users. The development of the Seamless ATM Plan in 2013 was the main mechanism for States to improve ANS and airspace performance on a region-wide basis. The Conclusions are as follows:

APANPIRG/22 (2011)

C 22/8 ADS-B Airspace Mandate
That, States intending to implement ADS-B based surveillance services may designate portions of airspace within their area of responsibility:
a) mandate the carriage and use of ADS-B equipment; or
b) provide priority for access to such airspace for aircraft with operative ADS-B as equipment over those aircraft not operating ADS-B equipment.

C 22/36 Amendment to Regional Supplementary Procedures on ADS-B
That, the Regional Supplementary Procedure Doc7030 MID/ASIA Chapter 5 be amended in accordance with the established procedure to include regional requirements on ADS-B as provided in the Appendix N to the report on Agenda Item 3.4.

APANPIRG/23 (2012)

Conclusion 23/5 – Asia/Pacific Air Navigation Concept of Operations Mandates
That, States intending to implement Performance-Based Navigation and Safety Nets may, after appropriate consultation with airspace users, designate portions of airspace within their area of responsibility:
a) as providing priority for access to such airspace for aircraft with prescribed Performance-Based Navigation (PBN) specifications and supporting data-link equipage (ADS-C/CPDLC); and/or
b) mandating the carriage and use of an operable Automatic Dependent Surveillance-Contract/Controller Pilot Data-link Communications Systems (ADS-C/CPDLC) system, and mode A/C and/or mode S transponder.

While it is recognised that States may introduce restrictions and performance-based measures over their sovereign territory, mandates over the High Seas need to be implemented in line with regional air navigation agreements; in this case through APANPIRG. Thus it is necessary to introduce an amendment to the Regional Supplementary Procedures (ICAO Doc 7030) for Asia/Pacific FIRs that allows States to designate portions of performance-based airspace when they are able to provide the performance benefit and in accordance with aircraft equipage and capability.

The level of ANS capability and aircraft equipage varies

throughout the Asia/Pacific, so it is intended that States will designate airspace when possible, in either exclusive or 'non-exclusive' (mixed mode with lower priority for non-equipped aircraft), as appropriate.

e) **Proposed Implementation Date of the Amendment:**

Upon approval of the Council

f) **Proposal Circulated to the Following States and International Organizations:**

Afghanistan	Mongolia
Australia	Myanmar
Bangladesh	Nauru
Brunei Darussalam	New Zealand
Cambodia	Palau, Republic of
China	Papua New Guinea
(cc: Hong Kong, China)	Philippines
(cc: Macao, China)	Republic of Korea
Cook Islands	Samoa
Democratic People's	Singapore
Republic of Korea	Solomon Islands
Fiji	Sri Lanka
France	Thailand
Indonesia	Timor-Leste
Japan	Tonga
Kiribati	United States
Lao People's	Vanuatu
Democratic Republic	Viet Nam
Malaysia	IATA
Maldives	IFALPA
Marshall Islands	IFATCA
Micronesia, Federated States of	

g) **Secretariat Comments:**

The amendment of Doc 7030 in respect of ADS-B, ADS-C, ACAS II and Mode S transponders, together with amendment proposals APAC-S 14/07 and 14/08 for MID/ASIA and PAC Regions, provides a framework for the state to establish performance based airspace, with consideration of such matters as existing and proposed airspace user equipages, mandate timing, definition of airspace volumes (both vertical and horizontal), exclusive or non-exclusive application, exemption provisions and management of State aircraft.

The amendment is specifically intended to enable States to promulgate airspace mandates over the High Seas, and to encourage a regional approach to the establishment of such mandates, where it is appropriate to do so and recognizing that it is not practical for the Asia/Pacific Region to establish Sub-Regional or Region-wide simultaneous mandates. This is in accordance with the concept of the Seamless ATM and performance-based approaches, as well as the Aviation System

Block Upgrade (ASBU) initiative and Global Air Traffic Management Operational Concept (ICAO Doc 9854).

Terms of Reference

AIR TRAFFIC FLOW MANAGEMENT STEERING GROUP (ATFMSG)

1. Having considered ~~the *ATS Planning Manual* (Doc 9426)~~ relevant documents such as the *Manual on Collaborative Air Traffic Flow Management* (Doc 9971), regional air traffic data and the ~~Major Traffic Flows~~ Asia/Pacific Region city pairs and associated airspace and ATS routes experiencing the most significant traffic demand, and noting ~~that recognized structural airspace capacity increasing measures have preference to use of ATFM~~ the Asia/Pacific Seamless ATM Plan provisions for structural airspace capacity increasing measures, develop an Asia/Pacific Regional ATFM ~~Concept of Operations(including principles and objectives)~~ Framework which addresses ATFM implementation and ATFM operational issues in the Asia/Pacific Region;

~~1. Review and update the *ATFM Communications Handbook for the Asia Pacific Region* until superseded by Global Material;~~

2. ~~Encourage and develop~~Identify, research and recommend appropriate guidance regarding:

   a. capacity assessment and adjustment mechanisms;

   b. regular review for all aerodromes and ATC sectors where traffic demand is expected to reach capacity, or is resulting in traffic congestion;

   c. mechanisms for ATFM data gathering, collation and sharing between States, International Organizations and ICAO, which may include;

      i. capacity assessments, including factors affecting capacity such as special use airspace status, runway closures and weather information;

      ii. traffic demand information which may include flight schedules, flight plan data, repetitive flight plan data as well as associated surveillance updates of flight status; and

      iii. ATFM Daily Plan;

   d. compliance by airspace users with ATFM measures; and

   e. any other guidance relevant to the Regional ATFM Framework.

3. ~~Research suitable and regionally harmonized benchmarks for airport acceptance rates (AAR) and the throughput of airspace (sector capacity) which may vary depending on weather conditions, and associated technique, e.g. the ground delay programme and miles/minutes in trail (MIT).~~ Maintain an overview of CDM/ATFM programs being conducted within the Region, with a view to facilitating their coordination and alignment.

4. Review the ~~safety and efficacy of~~ effectiveness of existing and planned ATFM ~~systems~~ programs in the Asia and Pacific Region, and make specific recommendations regarding ATFM, including any adjacent airspace affecting the Asia and Pacific Regions, and research and recommend appropriate mechanisms for the on-going review of such programs.

~~5. Encourage the development of an ATFM web site by Asia and Pacific Region States with significant experience in ATFM, which contains information on regional ATFM, including *inter alia*, real time flight delay data.~~

5. The Group has linkages to the Aerodromes Operations and Planning Working Group (AOP/WG), Regional ATM Contingency Plan Task Force (RACP/TF) and the Meteorological Requirements Task Force (MET/R TF).

6. The Group reports to the ATM~~/AIS/SAR~~ Sub-Group.

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State and Regional ATM Contingency Readiness

		Examples			Afghanistan	Australia	Bangladesh	Bhutan	Brunei Darussalam	Cambodia	China	Hong Kong, China	Macao, China	Cook Islands	DPR Korea	Fiji	French Polynesia	India	Indonesia	Japan	Kiribati	Korea, Republic of	Lao PDR	Malaysia	Maldives	Marshall Islands	Micronesia, Fed States of	Mongolia	Myanmar	Nauru	Nepal	New Zealand	Pakistan	Palau	Papua New Guinea	Philippines (working draft)	Samoa	Singapore	Solomon Islands	Sri Lanka	Thailand	Timor - Leste	Tonga	U.S.A	Vanuatu	Viet Nam	Reported States Preparedness (percentage)	Regional Preparedness (percentage)			
Reported Contingency Plan Status		1	1	0		1	1				1	1	1			1	1	1	1	1		1	1	1	1			1	1	1	1			*0*	1		1	1		1	1		1	X	57	**Reported Contingency Plan Status**	
Level 1 Plans																																																**Level 1 Plans**	
Level 1 Plans	Percentage of ATSU with Level 1 Plan	2	1	1		2						2	2				2	0	1				0				2		2		2	2			*0*	2		0	0		2	2			63	25			
Coordination, Testing and Review	Internal Coordination	1	1	0		1						0	0				0	1	1				1				0		1	1	1	1			*0*	1		1	1		1	1			73	26	Internal Coordination	**Coordination, Testing and Review**	
	Regular Testing	1	0	0		1						1	0				1	1	1				0				1		1	1	1	1			*0*	1		0	0		1	1			73	26	Regular Testing		
	Routine and event driven review	1	0	0		1						1	0				1	1	1				1				1		1	1	1	1			*0*	1		1	1		1	1			93	33	Routine and event driven review		
Category 1 and 2 Events	ATM/CNS System Failure or Degradation	1	1	1		1						1	1				1	1	1				1				1		1	1	1	1			*1*	1		0	1		1	1			100	36	ATM/CNS System Failure or Degradation	**Category 1 and 2 Events**	
	Staff Availability	1	1	1		1						1	0				1	1	0				0				1		0	0	1	1			*0*	1		0	1		1	1			60	21	Staff Availability		
	Volcanic Ash Cloud	1	0	0		1						0	0				1	0	1				1				1		1	0	1	0			*1*	1		0	0		0	1			60	21	Volcanic Ash Cloud		
	Earthquake	1	0	0		1						0	0				1	1	1				0				1		1	0	1	1			*1*	1		0	1		1	1			73	26	Earthquake		
	Inundation	1	1	0		1						0	0				1	1	0				0				1		1	0	1	0			*0*	1		0	1		1	1			60	21	Inundation		
	Nuclear Emergency	1	1	0		0						0	0				0	1	0				0				0		0	0	0	0			*0*	1		0	0		0	1			20	7.1	Nuclear Emergency		
	Pandemic	1	1	0		1						1	0				0	1	0				0				1		1	0	0	0			*0*	1		0	1		0	1			53	19	Pandemic		
	National Security	1	1	0		1						0	0				0	1	1				1				1		1	0	0	0			*0*	1		0	1		0	1			60	21	National Security		
DRAFT Basic Plan Elements (No. of sub-elements)	Administration (2)	2	1	0		2						0	1				2	2	2				2				2		2	2	2	2			*2*	2		2	2		2	2			97	35	Administration (2)	**DRAFT Basic Plan Elements**	
	Plan Management (2)	2	1	0		2						2	0				2	2	2				2				2		2	2	2	2			*1*	2		2	2		1	2			93	33	Plan Management (2)		
	Airspace (1)	1	1	0		1						0	0				1	1	0				1				1		1	0	1	0			*0*	1		0	1		0	0			53	19	Airspace (1)		
	ATM Procedures (7)	7	2	1		4						3	0				5	7	7				7				7		6	5	*5*	7			6	7		6	4						82	29	ATM Procedures (7)		
	Pilot/Aircraft Operator Procedures (5)	5	2	1		3						5	0				3	5	4				3				5		4	4	*5*	3			5	5		1	2						76	27	Pilot/Aircraft Operator Procedures (5)		
	Communications Facilities and Procedures (4)	4	2	1		2						2	0				4	4	4				4				4		4	2	*2*	4			1	2		2	0						68	24	Communications Facilities and Procedures (4)		
	Aeronautical Support Services (2)	2	2	0		1						0	0				2	2	2				2				2		2	2	*2*	1			1	2		2	1						80	29	Aeronautical Support Services (2)		
	Contact Details (2)	2	2	0		0						0	0				2	2	2				2				2		2	2	*2*	1			2	2		2	1						80	29	Contact Details (2)		
LEVEL 1 PLANS SCORES		**39**	**21**	**6**		**27**						**20**	**5**				**31**	**36**	**32**				**29**				**37**		**35**	**26**	*22*	**35**			**22**	**32**		**26**	**26**						**75**	**27**	**LEVEL 1 PLANS SCORES**	
Level 1 Readiness (Incomplete, Marginal or Robust)		R	M	I		M						M	I				R	R	R				M				R		R	M	*M*	R			M	R		M	M								**Level 1 Readiness (Incomplete, Marginal or Robust)**	
Level 2 Plans																																															**Level 2 Plans**	
Level 2 Inclusions	Formal Inter-State Agreements (LoA or MoU)	1	1	0		1						0	0				1	1	0				0				1		1	0	*1*	0			0	0		1	1						53	19	Formal Inter-State Agreements (LoA or MoU)	**Level 2 Inclusions**	
	Contingency Route Structure	1	0	0		1						0	0				1	0	1				0				1		0	0	*1*	1			1	1		1	0						53	19	Contingency Route Structure		
	Flight Level Allocation Scheme	1	0	0		1						0	0				1	0	1				0				1		0	0	*1*	1			1	1		1	0						53	19	Flight Level Allocation Scheme		
	Minimum Longitudinal Spacing	1	0	0		1						0	0				1	0	1				0				1		0	0	*1*	1			1	1		1	0						53	19	Minimum Longitudinal Spacing		
	Frequency Transfer Arrangements	1	1	1		1						0	0				1	0	1				0				1		1	0	*1*	1			1	1		1	0						67	24	Frequency Transfer Arrangements		
	Delegation of ATC Separation	1	1	0		0						0	0				1	0	0				0				1		0	0	*0*	1			1	0		1	0						33	12	Delegation of ATC Separation		
	Delegation of FIS and SAR Alerting Services	1	1	1		1						0	0				1	0	1				0				1		1	0	*1*	1			1	1		1	0						67	24	Delegation of FIS and SAR Alerting Services		
Level 2 Plan Scores		**7**	**4**	**2**		**6**						**0**	**0**				**7**	**1**	**5**				**0**				**7**		**3**	**0**	*6*	**6**			**6**	**5**		**4**	**1**						**54**	**19**	**Level 2 Plan Scores**	
Level 2 Plan Readiness		R	M	I		R						I	I				R	I	M				I				R		M	I	*M*	R			R	M		M	I								**Overall State Readiness**	

Level 1 Plans
0 to 15 = Incomplete
16 to 29 = Marginal
30 - 39 = Robust

Level 2 Plans
Incomplete: 0 - 2
Marginal: 3 - 5
Robust: 6 - 7

Decision 1/1 - ATM Contingency Plan Review Team Formation

That, an ATM Contingency Plan Task Force Review Team be established from the Task Force, that considered relevant portions of Level 1 (internal State) and Level 2 (Inter-State) ATM Contingency Plans, and identified areas where ATM contingency planning required improvement, in order to support the developmen of a Level 3 (Regional) ATM Contingency Plan, based on Basic Planning Elements agreed by the Task Force.

Terms of Reference

Regional ATM Contingency Plan Task Force (RACP/TF)

1) The objective of the Regional ATM Contingency Plan Task Force is:

   In collaboration with affected stakeholders and ensuring inter-regional harmonization, develop and implement a Regional ATM Contingency Plan that:

   i) provides a contingency response framework for States;

   ii) ensures a timely, harmonised and appropriate response to events that affect the provision of Air Traffic Services (ATS), or which ATS is involved in; and

   iii) provides a greater degree of certainty for airspace and aerodrome users during contingency operations.

2) To meet this objective the Task Force shall:

   a) Review the current status of ATM Contingency Plans and the contingency preparedness of Asia and Pacific Region States;

   b) Identify areas where ATM contingency planning requires improvement in terms of compliance with Annex 11 and accepted best practice, and to make recommendations on those areas of improvement;

   c) Analyse contingency procedures in use in other ICAO Regions, and cooperate with other groups which are involved with similar work in adjacent airspaces, in order to achieve harmonized inter-regional solutions;

   e) Develop a Regional ATM Contingency Plan that:

      i) takes into account the varying levels of contingency response necessary, commensurate with precipitating events;

      ii) takes into account the varying levels of State contingency capability;

      iii) provides principles for Regional ATM Contingency planning;

      iv) details recommended Regional contingency practices to events such as severe meteorological and geological phenomena, health emergencies (pandemics, etc), military conflicts and industrial relations issues; and

      v) where practical, provides contingency planning templates for States.

The Task Force reports to APANPIRG through the ~~ATM/AIS/SAR~~ ATM Sub-Group for planning, coordination and implementation of a regional ATM contingency plan, with a link to the ~~METWARN/I~~ MET/H Task Force.

PBN Navigation Specification Comparison

Nav Spec	Environment	COM	Route Spacing	Required Sensors	Database, sequencing	On-board monitoring
RNAV 1/2 (P-RNAV)	All IFR En-route RNAV 1 SIDs STARs with surveillance	DCPC*	None specified [+2]	GNSS; or DME/DME; or VOR/DME; DME/DME/IRU	Yes	No but present with GNSS
RNAV 5 (B-RNAV)	Low-end IFR aircraft En-route with surveillance	VHF only	None specified [+1]	GNSS; or DME/DME; or VOR/DME; DME/DME/IRU	Database optional but waypoints capability required	No but present with GNSS
RNP 1	All IFR SIDs STARs	DCPC*	3NM with surveillance	GNSS or GNSS/IRU	Yes	Yes
RNP 2	All IFR En-route Category R airspace en-route (dual systems required)	DCPC*	15NM LAT 20NM LONG 7-10NM Terminal (Draft)[+3]	GNSS; or GNSS/IRU	Yes	Yes
RNP 4	Category R/S en route	CPDLC	With CPDLC and ADS-C: 30NM LAT 30NM LONG	GNSS or GNSS/IRU	Yes	Yes

*VHF and CPDLC

[+1] Europe uses 18NM reciprocal direction, 16.5NM same direction with surveillance, 10NM special cases

[+2] Republic of Korea demonstrated high density 8NM parallel spaced routes with surveillance met TLS

[+3] Australia uses 7NM CEP en-route (=15NM spacing) in procedural airspace, 5NM with surveillance

Notes:

1. *RNAV 5 does not require a navigation database but the system must have the capability of creating a flight plan with at least 4 waypoints. If a navigation database is used, the standard database management criteria should be applied.*
2. *RNAV 5, RNAV 1 and RNAV 2 are intended for use in a surveillance environment but may be used for short durations without surveillance.*
3. *RNAV 2 is a low accuracy version of RNAV 1.*
4. *RNP 4 is a navigation specification that is normally used to achieve reduced separation in a category R airspace environment that requires CPDLC and ADS-C.*

ASIA/PACIFIC REGION ATS ROUTE CATALOGUE

(ATM/SG/2 Version)

INTERNATIONAL CIVIL AVIATION ORGANIZATION

ASIA/PACIFIC REGIONAL OFFICE

VERSION ~~12~~ 13

~~26 June 2013~~ Aug 2013

Table of Contents

Foreword

The *Air Navigation Plan – Asia and Pacific Regions* (Doc 9673), Volume I, Basic ANP (BANP) contains ATS route requirements which were developed by the Third Asia and Pacific Regional Air Navigation Meeting (Bangkok, May 1993). The requirements have been revised from time to time to reflect current operational needs. There is also an ongoing need to revise and update these requirements.

The fourteenth meeting of the ASIA/PAC Air Navigation Planning and Implementation Regional Group (APANPIRG/14, August 2004) under Conclusion 14/5 established the ATS Route Network Review Task Force (ARNR/TF) to review the Asia and Pacific ATS route network as contained in the BANP, determine present and future route requirements, and revise the BANP as appropriate. To facilitate the amendment process and keep track of route implementation and future requirements, and with the objective of providing more up to date information on route developments, ARNR/TF prepared the draft *Asia/Pacific ATS Route Catalogue* as a supplement to the BANP.

APANPIRG/16 (August 2005, Bangkok), recognizing the value of a consolidated reference document for the regional ATS routes and future route requirements of States and airspace users, accepted the Route Catalogue under Decision 16/9. The Route Catalogue is intended to be a living document, supplementing the BANP and maintained by ICAO Asia and Pacific Office. Communication in relation to the Route Catalogue should be made via email to the ICAO Asia and Pacific Office at icao_apac@bangkok.icao.int.

A Contracting State or qualifying international organization identifying a need for a new route requirement to be included in the BANP or to change an existing route contained in the BANP, may submit an amendment proposal to the Secretary General for approval by the President of the Council in accordance with established procedures summarized below.

Appropriately presented and documented proposals to amend the BANP are submitted to the ICAO Secretary General through the Regional Office and circulated to States and International Organizations for comment. Once all parties concerned agree to the proposal, the Secretary General will submit the proposal to the President of the Council for approval. The Regional Office will inform States and international organizations concerned of the approval and the BANP will be amended accordingly.

The Regional Office, which is responsible for maintaining the ATS Route Catalogue, will update the Route Catalogue from time to time as amendment proposals are presented, progressed and agreed or not agreed. The revision number and date shown on the cover page of the catalogue, which is posted on the ICAO APAC website (http://www.bangkok.icao.int/).

The Reformatted ATS Route Catalogue is now revised as follows:

Chapter A: Routes in BANP

Chapter 1, 2, 3 and 4: Future Requirements – Users & States

Chapter A lists ATS routes which have been contained in the BANP. Chapter A will be amended by the Regional Office subsequent to approval of an amendment to the BANP by the President of the Council. It is expected that Chapter A will become redundant when the electronic ANP (e-ANP) formats become available in 2013.

Note: — As the ATS Route Catalogue Chapter A *is intended for use as a supplement to the BANP, it does not replace the BANP nor should it be used as an operational document. Its primary purpose is to assist States and airspace users by providing more up to date information, to develop and maintain the ATS routes in the Asia and Pacific Region.*

Chapters 1 to 4 list ATS routes proposed by States and international organizations in accordance with their geographical disposition. These routes have not been included in the BANP or implemented, and have no specific status, other than having been presented as a proposal and subject to consultation and review.

Regional ATS route proposals affecting Asia/Pacific airspace should be presented as part of a paper to ATM coordination groups or other suitable bodies, and then may be entered into the Route Catalogue by the Regional Office. The Regional Office will periodically present to appropriate ATM coordination groups or other suitable bodies the proposals within their geographical area of interest for review. After review, the ATS Route Catalogue may be updated by:

- Amendment to transfer proposals to Chapter A that have been agreed after subsequent proposal for amendment of the BANP; or
- Deletion of the proposal when it has been decided that there is no possibility of implementation in the foreseeable future; or
- Amendment with the addition of supplementary information; or
- Addition of a new ATS route proposal.

Amendment Record

Version/Amendment Number	Date	Amended by	Comments
0.1	14 February 2005	-	ARNR/TF/2 developed the draft version.
0.2	5 May 2005	ARNR/TF/3	Finalized the format following contribution from the members.
0.3	29 July 2005	ATM/AIS/SAR/SG/15	Sub-Group concluded that the Catalogue be adopted (Draft Conclusion 15/3).
1	26 August 2005	APANPIRG/16	APANPIRG/16 decided that the Catalogue be accepted (Decision 16/9).
2	24 January 2006	BBACG/17	Reviewed and updated the Catalogue.
3	19 May 2006	SEACG/13	Reviewed and updated the Catalogue.
4	26 January 2007	BBACG/18	Reviewed and updated the Catalogue.
5	23 May 2008	SEACG/15	Reviewed and updated the Catalogue.
6	15 May 2009	SEACG/16	Reviewed and updated the Catalogue.
7	27 May 2010	SEACG/17	Reviewed and updated the Catalogue.
8	10 March 2011	BBACG/21	Reviewed and updated the Catalogue.
9	6 May 2011	SEACG/18	Reviewed and updated the Catalogue.
10	22 September 2011	SAIOACG/1	Reviewed and updated the Catalogue.
11	22 June 2012	ATM/AIS/SAR/SG/22 APANPIRG/23	Reviewed, reformatted, and updated the Catalogue, approved by APANPIRG/23.
12	26 June 2013	SAIOACG/SEACG, ATM/SG	Reviewed, reformatted, and updated the Catalogue, approved by APANPIRG/24.
13	????	???	Reviewed subsequent to Easter Island being transferred out of the Region; added European trans-regional proposals

Chapter A: Routes in BANP

The segments which have not been implemented are shown by **bold** significant points.

LOWER ATS ROUTES

A1
LIMLA 1546.0N 09836.0E
BANGKOK
UBON
DANANG
BUNTA
IKELA 1839.7N 11214.7E
CHEUNG CHAU
ELATO 2220.0N 11730.0E
MAKUNG
TAIBEI
KAGOSHIMA
~~MIYAKE JIMA~~
HACHIJO JIMA
(APAC 14/01 – ATS)

A91
(KYAKHTA)
SERNA 5018.5N 10628.1E
ULAN BATOR

A201
LASHIO
AGARTALA
RAJSHAHI
MONDA 2521.00N 08626.25E
PATNA
LUCKNOW

A202
CHEUNG CHAU
SIKOU 2050.6N 11130.0E
SAMAS 2030.3N 11029.7E
ASSAD 182028N 1074053E
XONUS 1804.2N 10714.0E
DONGHOI
VILAO 1718.0N 10600.0E
SAVANNAKET
KORAT
BANGKOK

A204
YOROI 4500.5N 14147.1E
RISHIRI
AKSUN 4545.1N 14054.3E
(SELTI) (4713.3N 14013.3E)

A206
Proposed by Vietnam and Laos
ASSAD
VINH
NONGT
LUANG PRABANG

A211
MANADO
TARAKAN
TAWAU

A212
PUPIS
PAGO PAGO
NIUE

A215
PORT MORESBY
MERAUKE
HASANUDDIN
KEVOK 0425.0S 11500.0E

A216
COOKTOWN
AKMIP 1200.0S 14448.6E
KIKORI
GUNNY 0500.00N 14400.00E
RICHH 1711.49N 14249.12E

A218
HARBIN
(EKIMCHAN)
(MYS SHMIDTA)
BARROW

A219
KARACHI
NAWABSHAM
KALAT 2902.0N 06635.0E
SERKA 2951.0N 06615.0E
KANDAHAR
(TERMEZ)

A220
CLUKK 3605.0N 12450.0E
TAHITI

A221
GUAM
ROTA IS
TINIAN IS
SAIPAN

A222
GUAM
POHNPEI
KOSRAE
KWAJALEIN

A224
JOHOR BAHRU
MERSING

A325 PRARATAPGARH
TASOP 2514.1N 07045.0E
KARACHI
JIWANI

A326 SHIGEZHUANG
OKTON 3911.2N 11653.5E
TIANJIN
MAKNO 3827.6N 12110.0E
SANKO 3814.2N 12228.4E
DONVO 3734.0N 12320.0E
AKARA 3130.0N 12330.0E

A331 ZIGIE 2419.0N 15717.5W
SEDAR 4530.4N 12643.0W

A332 APACK 2402.8N 15619.3W
AMITY 2626.0N 15229.0W
HEMLO 4318.2N 12640.8W

A334 HAT YAI
KOTA BHARU

A337 ADKAK 3354.0N 14210.0E
TEGOD 2100.0N 14512.0E
JUNIE 1132.5N 14706.3E
KISME 0500.0N 14805.4E

A338 CHRISTCHURCH
APORO 5000.0S 17120.0E
BYRD

A339 PERTH
CURTIN
ELBIS 0905.9S 12743.7E
SHREE 0539.0N 13109.2E
KEITH 2100.0N 13456.8E
SABGU 2529.9N 13459.3E
MAKDA 2716.0N 13551.2E
TAXON 3000.0N 13714.5E
YOSHI
~~MIYAKE JIMA~~
(APAC 14/01 – ATS)

A340 RAYONG
BISOR 1221.0N 10247.0E
PHNOM PENH

A341 KOTA KINABALU
SANDAKAN
ZAMBOANGA

A342 COLD BAY
OLCOT 5125.8N 16533.3E

A344 ROZAX 0245.6S 11140.0E
SUMBAWA

A345 PYONGYANG
GOLOT 4012.5N 12430.5E
FENGCHENG
KAIYUAN
HAILAR
KAGAK 4916N 11806E
MANLI 4935N 11727E
TELOK 4938N 11722E
(CHITA)

A346 HAMILTON IS
AUCKLAND

A347 MUMBAI
BODAR 2236.3N 07413.3E
PRATAPGAPH
DELHI

A348 MELBOURNE
EAST SALE
NISEP 4146.6S 15601.5E

A364 SHACHE
KASHI
KURUM 4006.0N 07407.0E

A450 DENPASSAR
HASSANUDDIN
CAHYO 033000N 1333000E
YAP IS
GUAM
WAKE
KATHS 2104.6N 16123.4W

A453 (KANDAHAR)
(ZAHEDAN)
(BANDER ABBAS)

A454 KARACHI
PARET 2527.2N 06451.5E
TAPDO 2424.0N 06120.0E
(VUSET)

A455 PESHAWAR
METAR 3406.0N 07128.0E
KOTAL 3406.0N 07109.0E

A456 AMRITSAR
LAHORE
MOLTA 3012.0N 07236.2E
BINDO

A457 HAT YAI
TAMOS 0632.2N 10024.0E
ALOR SETAR
PENANG
KUALA LUMPUR
JOHOR BAHRU

A460 KUQA
REVKI 4232.5N 8013.2E
(KIRBALTABAY)

A461 DAWANGZHUANG
WEIXIAN
ZHOUKOU
HEKOU
LONGKOU
LILING
YINGDE
SHILONG
BEKOL 2232.6N 11408.0E
CHEUNGCHAU
NOMAN 2000.0N 11640.3E
MUMOT 1930.4N 11714.5E
AVMUP 1843.3N 11808.3E
SAN FERNANDO
CABANATUAN
MANILA
SAN JOSE
ZAMBOANGA
AMBON
DARWIN
ALICE SPRINGS
LEIGH CREEK

A462 KOLKATA
DHAKA

A464 CHIANG MAI
BANGKOK
HAT YAI
IPOH
BATU ARANG
KUALA LUMPUR
SINGAPORE
TINDAL
TAROOM
LORD HOWE IS
AUCKLAND

A465 KOLKATA
VISHAKAPATNAM
CHENNAI
COLOMBO

A466 (KABUL)
SANAM 3305.0N 07003.0E
DERA ISMAIL KHAN
JHANG 3116.0N 07218.0E
SAMAR 3120.8N 07434.0E
ASARI 3048.3N 07509.6E
DELHI

A467 BIRATNAGAR
KATIHAR
KOLKATA

A468 KUQA
KAMUD 4134.0N 07850.0E

A469 HO CHI MINH
CONSON IS

A470 HONG KONG
MAGOG 2217.3N 11549.4E
SHANTOU
XINGLIN
FUZHOU
YUNHE
TONGLU
HANGZHOU
LISHUI
BANTA
PIXIAN

A472 KOTAL 3406.0N 07109.0E
METAR 3406.0N 07128.0E
BAREV 3406.0N 07135.0E
PESHAWAR

A474 DELHI
ASOVO
MUMBAI
MURUS 0600.0S 06319.7E
(PLAISANCE)

A575 PYONGYANG
GOLOT 4012.5N 12430.5E
FENGCHENG
DONGYANGJIAO
DAHUSHAN
CHAOYANG
ANDIN 4106.0N 11843.5E
GUBEIKOU
FENGNING
EREN

INTIK 4341.5N 11155.0E
SAINSHAND
ULAN BATOR
(KYZYL)

A576 MEDAN
SINGAPORE
DENPASAR
CURTIN
ALICE SPRINGS
PARKES
SYDNEY

A577 SHIKANG
KADET 2100.0N 11934.0E

A578 TONIK 3200.0N 14600.0E
PHONPEI
NAURU
TARAWA
NADI
AUCKLAND

A579 SYDNEY
NADI
CARRP 1904.4N 15935.0W

A580 AUCKLAND
NAUSORI
APIA

A581 BAGO
CHIANG MAI
CHIANG RAI
PONUK 2018.8N 10023.0E
SAGAG 2111.5N 10137.4E
BIDRU
KUNMING
MAGUOHE
QIANXI
HUAYUAN
LINLI
WUHAN

A582 JOMALIG
~~CHINEN~~
NAHA
KAGOSHIMA
IKISHIMA
BUSAN
SEOUL
(APAC13/09 – ATS)

A583 HONG KONG
SABNO 1859.1N 11550.7E
MAVRA 1814.4N 11615.1E
AKOTA 1706.6N 11651.6E
IBOBI 1354.4N 11832.6E
REKEL 1324.1N 11848.3E
LEGED 1301.9N 11859.6E
TOKON 1142.0N 11940.3E
ZAMBOANGA

A584 TONGA
NIUE
APIA
FUNAFUTI
NAURU

A585 PALEMBANG
JAKARTA
PORT HEDLAND
CEDUNA
ADELAIDE

A586 INTOS 3722.00N 13120.00E
PUSAN
CHEJU
ERABU
NAHA

A587 SUMBAWA
ALICE SPRINGS

A588 DALIAN
WAFANGDIAN
WANGBINGOU
KAIYUAN
CHANGCHUN
HARBIN
SIMLI 5017.4N 12722.1E

A589 DELHI
BUTOP 2919.7N 07523.9E
ASARI 3048.3N 07509.5E

A590 JOMALIG
MINAMI DAITO
YOSHI 3310.2N 13857.4E
~~MIYAKEJIMA~~
OYAMA
KAGIS 3549.0N 14234.0E
PABBA 3700.0N 14400.0E
PASRO 1417.1N 16040.5E

(AMOTT) 6054.0N 15121.6W
(APAC 14/01 – ATS)

A591 QINDAO
XUEJIADAO
LATUX 3532.0N 12044.0E
MUDAL 3651.0N 12322.0E
AGAVO 3710.0N 12400.0E

A592 PUPIS 1000.0S 17105.5W
APIA
VAVA'U
TONGA

A593 TANGHEKOU
XILIUHETUN
SHIGEZHUANG
POTOU
PIXIAN
WUXI
SHANGHAI
NANHUI
FUKUE

A595 FUKUOKA
IKISHIMA
CHEJU

A596 HUAIROU
HUAILAI
TIANZHEN
LIANGCHENG
BAOTOU
DENGKOU
YABRAI

A597 ~~GOBOH~~
KUSHIMOTO
MONPI 2100.0N 14036.0E
GUAM
HONIARA
NOUMEA
AUCKLAND
(APAC13/9 – ATS)

A598 BRISBANE
HONIARA
NAURU
MAJURO

A599 CHITTAGONG
LINSO 2322.5N 09855.0E
GENGMA
KUNMING
LUXI
BOSE
LAIBIN
GAOYAO
PINGZHOU
ZHULIAO
WONGYUAN
NANXIONG
GANZHOU
NANFENG
SHANGRAO
TONGLU
NANXUN
SHANGHAI

A791 (IMLOT)
JIWANI
KARACHI
PRATAGARH
BHOPAL
JAMSHEDPUR
KOLKATA

B200 ENKIP 3547.0S 17730.0E
FICKY 3133.6N 12123.5W

B202 UBON
PAKSE
PLEIKU

B203 KATHMANDU
BAGDOGRA
GUWAHATI
SILCHAR
IMPHAL
LASHIO

B204 GOMES 1324.0N 10135.3E
SIEM REAP

B205 RAYONG
BOKAK 1257.5N 10230.0E
SIEM REAP

B206 URUMQI
FUKANG
ALTAY
GOPTO 4905.5N 08728.0E
(AKTASH)

B209 JAMSHEDPUR

KHAJURAHO
TIGER 2828.8N 07214.9E

B210 TASOP 2513.3N 07048.9E
NAWABSHAH

B211 MUMBAI
EPKOS 1653.1N 07407.2E
CHENNAI

B213 LHASA
CHENGDU

B214 NASAN
LADON 2106.2N 10258.0E
AKSAG 2049.1N 10027.3E

B215 DAWANGZHUANG
TAIYUAN
YINCHUAN
YABRAI
JIUQUAN
HAMI
FUKANG
URUMQI
KUQA
SHACHE
HONGQILAPU
PURPA 3656.5N 07524.5E
GILGIT
ISLAMABAD

B218 KUNMING
SIMAO 2243.1N 16058.2E
SAGAG 2111.5N 10137.4E
VIENTIANE
LOEI
CHUM PHAE

B219 PENANG
KOTA BHARU

B220 BRISBANE
PORT MORESBY

B221 NINAS 3100.0N 12215.0E
PINOT 3125.2N 12214.2E
SAGUT 3500.0N 12040.3E
XUEJIADAO

B222 VINIK 0838.6N 11613.8E
KOTA KINABALU

B223 (DABUR 5147.1N 14235.9E)
LUMIN 4545.0N 14150.3E
WAKKANAI

B326 HONIARA
CHOKO 2022.6N 16053.0W

B328 EREN
TAMURTAI
TIANZHEN
NANCHENGZI
WEIXIAN

B329 PHNOM PENH
PAKSE
LEBAL 1630.2N 10556.7E
VILAO 1722.0N 10605.0E
~~NAM HA 2023.2N 10607.1E~~
APAC 13/18 – ATS

B330 HONG KONG
TAMOT
PINGZHOU
GAOYAO
DOUJIANG
QUIANXI
FUJIACHANG
JINGTAI
YABRAI
MORIT 4202.0N 10249.0E
NIDOR 5029.4N 09125.8E
(LIKAR)

B331 CHEUNG CHAU
KAPLI 2110.0N 11730.0E
HENGCHUN

B332 SANKO 3814.2N 12228.4E
TOMUK 3843.0N 12400.0E
PYONGYANG
SINSONGCHON
SONDO 3947.0N 12713.6E
KANSU 3838.0N 13228.5E

B333 AUCKLAND
PORT MORESBY

B334 BEIJIN
TANGHEKOU
FENGNING
TONGLIAO

B337 (TAKHTOYAMSK)
ANIMO 4508.3N 14337.8E
ASAHIKAWA

B338 MERSING
TEKONG
ANITO 0017.0S 10452.0E

B339 ULAN BATOR
POLHO 4447.0N 11315.0E
FENGNING

B345 KATHMANDU
BHARATPUR
BHAIRAHAWA
LUCKNOW

B346 LUANG PRABANG
NOBER 1516.6N 10040.1E
BANGKOK

~~B348 HENGCHUN~~
~~POTIB 2100.0N 12045.5E~~
~~LAOAG~~
~~SAN FERNANDO~~
~~MANILA~~
~~TOKON 1142.0N 11940.3E~~
~~PUERTOPRINCESA~~
~~OSANU 0741.4N 11717.6E~~
~~KOTA KINABALU~~
~~BRUNEI~~
~~KAMIN 0235.1N 10855.7E~~
~~SABIP 0209.7N 10750.5E~~
~~TOMAN 0121.5N 10547.0E~~
APAC 13/22 - ATS

B349 BALI
POTIP 2141.6S 12508.0E

B450 SYDNEY
LORD HOWE IS
NORFORK IS
PAGO PAGO

B451 HAILAR
QIQIHAR
HARBIN
BISUN 4314.0N 13111.8E
(VLADIVOSTOK)
IGROD 4139.0N 13647.0E
KADBO 3914.0N 13745.0E

B452 TONIK 3200.0N 14600.0E
HONIARA
NADI

B453 MIDDLETON IS
KATCH 5400.0N 13600.0W
DAASH 4226.5N 12600.1W

B454 PAGO PAGO
RAROTONGA
TONYS 3019.9N 12249.2W

B455 VAVA'U
NISEX 1547.3S 17136.4W

B456 WEWAK
JAYAPURA

B459 MUMBAI
CLAVA 0134.0N 06000.0E
(PRASLIN)

B460 KHORAT
SAVANNAKET

B462 MACKAY
HAMILTON IS.
PORT MORESBY
KADAB 0458.0S 14100.0E
BIDOR 0400.0S 13130.0E
TACLOBAN
MANILA
CABANATUAN
LAOAG
MIYAKO JIMA
OKINAWA

B463 BAGO
MANDALAY
LASHIO

B465 KOLKATA
CHITTAGONG
MANDALAY
LUANG PRABANG
HANOI

B466 JOHOR BAHRU
BATU ARANG
CHENNAI
MUMBAI

B467 KANGWON
INTOS 3722.0N 13120.0E
KANSU 3838.0N 13228.5E
NULAR 4059.2N 13411.0E
(TEKUK) 4241.0N 13527.4E

B468 DIENBIEN
LADON 2106.2N 10258.0E
LUANG PRABANG

B469
SINGAPORE
JAKARTA
CARNARVON
GERALDTON
PERTH
CAIGUNA
WHYALLA
GRIFFITH
SYDNEY

B470
SINGAPORE
PANGKALPINANG
JAKARTA

B472
LIPA
ILO ILO
COTABATO
SELSO 0400.0N 12616.0E
TOREX 0724.0N 13335.0E
GOVE
NORMANTON

B473
LIPA
ROXAS
CAGAYAN-DE-ORO
DAVAO
SADAN 0400.0N 12805.0E
CAIRNS

B474
SYDNEY
SANTO
NANUMEA
CHOKO 2022.6N 16053.0W

B480
(RAZDOLITE)
LETBI 5011.9N 10330.6E
BULGAN
MORIT 4202.0N 10249.0E

B575
AUCKLAND
TONGA
PAGO PAGO

B576
TAIBEI
CHEJU
SEOUL

B577
NADI
WALLIS IS
APIA
PAGO PAGO
FICKY 3133.5N 12123.5W

B578
BRISBANE
NOUMEA
TAHITI

B579
PHUKET
LANGKAWI
PENANG

B580
SYDNEY
NOUMEA
CHOKO 2022.6N 16053.0W

B581
NADI
FICKY 3133.5N 12123.5W

B583
BRUNEI
DARWIN

B584
DENPASAR
ELANG 0056.0S 11449.5E
KOTA KINABALU

B586
NOUMEA
SEKMO
KAPKI
PORT MORESBY
GUAM
OMLET 2100.0N 14259.2E
TATEYAMA

B587
ST GEORGE
KOWANYAMA
OPABA 0851.5S 13804.0E
TIMIKA
BIAK
RENAN 0330.0N 13416.6E
ENDAX 1415.0N 13000.0E
ATVIP 2100.0N 12422.0E
HUALIEN

B589
PORT MORESBY
KAPKI 1014.9S 14817.7E
BUKA
MAJURO

B590
NOUMEA
PORT VILA
NAURU

B591
SHANGHAI
TAIBEI
HENCHUN
(Partially implemented)

B592
KOTA KINABALU
JAKARTA

B593 KOLKATA
COMILLA
AGARTALA
GUWAHATI

B595 TAHITI
KONA

B596 RAROTONGA
DOVRR 1843.0N 15740.0W

B597 ERABU
TANEGASHIMA
SHIMIZU

B598 DARWIN
THURSDAY ISLAND
PORT MORESBY
KAPKI 1014.9S 14817.7E
HONIARA
PORT VILA
NADI
NAUSORI
TONGA
RAROTONGA

B599 NOUMEA
NADI
TAHITI

B757 KATCH 5400.0N 13600.0W

CAPE NEWENHAM
NULUK 5822.9N 17706.1W

B932 BAMOK 5625.5N 17249.3E
(NETRI 4739.3N 15000.0E)
ODERI 4439.0N 14515.2E
MEMANBETSU

G200 CHRISTMAS IS.
COCOS IS
(PLAISANCE)

G202 (KANDAHAR)
ZHOB
RAHIM YAR KHAN

G203 MIHO
PUSAN

G204 ELNEX
SHENGXIAN
METAN
SHANGHAI

G205 HAMILTON IS.
GURNEY
JUNIE

G206 DILARAM
KABUL
SABAR
PURPA

G208 MUMBAI
PARTY 2414.6N 07052.0E
KARACHI
PANJGUR
(ZAHEDAN)

G209 LAERMONTH
CHRISTMAS ISLAND
PALEMBANG

G210 PANJGUR
KARACHI
MUMBAI

G212 (KHABAROVSK)
ARGUK 4753.5N 13439.4E
HAIQING
JIAMUSI
HARBIN
TONGLIAO
GUBEIKOU
QINBAIKOU
NANCHENGZI
TAIYUAN
YIJUN
SANYUAN
XIAOYANZHUANG
NINGSHAN
WUFENGXI
FUJIACHANG
WEINING
MAGUOHE
KUNMING

G213 BIAK
BEKUB 0350.0N 13845.0E
GUAM

G214 JIWANI
PANJGUR
RAHIM YAR KHAN
MOLTA 3012.0N 07236.2E

G215 DUTCH HARBOR

	OLCOT	5125.8N 16533.3E
G216	(DORAB)	
	ALPOR	2404.7N 06120.0E
	LATEM	2431.7N 06449.7E
	KARACHI	
G218	HOHHOT	
	TUMURTAI	
	POLHO	4447.0N 11315.0E
	SOLOK	4954.0N 11545.0E
G219	VIRUT	0230.8N 10402.7E
	TEKONG	
G221	PHUCAT	
	BUNTA	1650.0N 10923.7E
	BAOLONG	
	HAIKOU	
	SAMAS	
	SIKOU	
G222	SAPDA	
	BROOME	
	AYERS ROCK	
	PARKES	
G223	TATEYAMA	
	TONIK	3200.0N 14600.0E
	NAURU	
	NADI	
	NAUSORI	
	NIUE	
	AITUTAKI	
	TAHITI	
	(LIMA)	
G224	NORFORK IS	
	NADI	
	PAGO PAGO	
	TAHITI	
	ISLA DE PASCUA	
	(SANTIAGO)	
G325	COLOMBO	
	TIRUCHCHIRAPPALLI	
G326	BALI	
	TENNANT CREEK	
	BRISBANE	
G327	NANHUI	
	NINAS	3100.0N 12215.0E
	AKARA	3130.0N 12330.0E
G329	BRISBANE	
	NORFORK IS	
G330	SHANGHAI	
	POMOK	
	NANTONG	
	GURNI	3209.2N 12058.5E
	PIMOL	3215.0N 11944.0E
G331	PHUKET	
	PADET	
	DAWEI	
G332	TANGHEKOU	
	CHAOYANG	
G333	DELHI	
	ESDEM	
	TIGER	2828.8N 07214.9E
G334	KUALA LUMPUR	
	TIOMAM	
	BUNTO	0242.0N 10600.0E
	DOTAS	0201.1N 10820.5E
	SIBU	
G335	KATHMANDU	
	JANAKPUR	
	PATNA	
G336	DHANBAD	
	PATNA	
	SIMRA	
	KATHMANDU	
G337	PERTH	
	CHRISTMAS IS	
	PEKANBARU	
G338	CHOIBALSAN	
	KAGAK	
G339	PUSAN	
	FUKUOKA	
	KAGOSHIMA	
	TANEGASHIMA	
	PAKDO	
	GUAM	
G340	QINGBAIKOU	
	HUAILAI	
G341	CHANGCHUN	
	WANGQING	
G342	CAIRNS	

	HONIARA	
G344	COMFE	3624.0N 14618.0E
	CUTEE	4624.9N 16218.6E
	CUDDA	5647.9N 16018.1W
G345	UNTAN	
	CHANGZHOU	
	LISHUI	
G346	KIMCHAEK	
	NULAR	4059.2N 13411.0E
	IGROD	4139.0N 13647.0E
G347	AUCKLAND	
	POPIR	2500.0S 17804.8W
	PADDI	1825.7N 15854.8W
G348	PARO	
	BAGDOGRA	
	MECHI	
	KATHMANDU	
G424	(DAR ES SALAAM)	
	VUTAS	0912.0N 06000.0E
	ALATO	1340.7N 06344.0E
G450	(MOGADISHU)	
	MUMBAI	
	NAGPUR	
	KOLKATA	
G451	AHMEDBAD	
	SASRO	2404.3N 07100.0E
	PARTY	2414.6N 07052.0E
G452	(ZAHEDAN)	
	RAHIM YAR KHAN	
	TIGER	2828.8N 07214.9E
	DELHI	
G453	KUALA LUMPUR	
	KOTA BHARU	
G454	(PLAISANCE)	
	BOBOD	0600.0S 06941.1E
	PADLA	0446.1N 07800.0E
	COLOMBO	
G455	SHANGHAI	
	PINOT	3125.2N 12214.2E
	AKARA	3130.0N 12330.0E
G457	DOVRR	1843.0N 15740.0W
	ELLMS	0500.0S 16704.1W
	PAGO PAGO	
	FAROA	2500.0S 17502.3W
	DIVSO	3452.3S 17624.5E
G458	BANGKOK	
	SURAT THANI	
	PHUKET	
G459	CAIRNS	
	TIMIKA	
G460	KUCHING	
	SIBU	
	BINTULU	
	BRUNEI	
G463	RAJSHAHI	
	DHAKA	
	CHITTAGONG	
	BAGO	
	BETNO	1505.8N 09812.7E
	BANGKOK	
G464	PONTIANAK	
	ROZAX	0245.0S 11140.0E
	BALI	
	KARRATHA	
	BALLIDU	
	PERTH	
G465	(PRASLIN)	
	MALE	
	COLOMBO	
G466	HO CHI MINH	
	PHUCAT	
	HENGCHUN	
G467	LUBANG	
	JOMALIG	
	GUAM	
G468	PENANG	
	MEDAN	
G469	PORT HEIDEN	
	ST PAUL IS	
	NYMPH	5324.5N 16814.4E
G470	XIANYANG	
	FENGHUO	
	CHANGWU	
	JINGNING	
	JINGTAI	
	QITAI	

G471	SHILONG	
	LONGMEN	
	GANGZHOU	
G472	KARACHI	
	AHMEDABAD	
	NAGPUR	
	BHUBANESHWAR	
	PATHEIN	
	BAGO	
G473	BAGO	
	MAKAS	1649.7N 09830.0E
	PHITSANULOKE	
	UBON	
G474	BANGKOK	
	MENAM	1357.3N 10247.7E
	SOURN	1345.5N 10600.0E
	ANINA	1359.0N 10725.0E
	PHUCAT	
G575	TAHITI	
	RANGIROA	
	FICKY	3133.5N 12123.5W
G576	CHEER	5310.0N 14000.1W
	SPONJ	4992.0N 13005.1W
G578	GURAG	2100.0N 12725.0E
	DILIS	1431.0N 12600.0E
	TACLOBAN	
	MACTAN	
	ZAMBOANGA	
	DENPASAR	
	PORT HEDLAND	
	PARABURDOOD	
	PERTH	
G579	JAKARTA	
	PALEMBANG	
	SINGAPORE	
	JOHOR BAHRU	
G580	TOMAN	0121.5N 10547.0E
	NIMIX	0124.9N 10759.2E
	ATETI	0125.7N 10830.1E
	KUCHING	
	MIRI	
	BRUNEI	
G581	HONG KONG	
	ELATO	2220.0N 11730.0E
	HENGCHUN	
	MIYAKO JIMA	
	BISIS	2647.0N 12633.0E
	ERABU	
	TAPOP	3240.0N 13607.9E
	~~MIYAKE JIMA~~	
	(APAC 14/01 – ATS)	
G582	PUGER	0324.1N 10017.6E
	BATU ARANG	
	PEKAN	
G583	EMMONAK	
	BESAT	5945.0N 17925.1W
	(UST-BOLSHERETSK)	
	BISIV	4456.3N 14412.3E
	MONBETSU	
G584	KUALA LUMPUR	
	PEKAN	
	KUCHING	
G585	MIHO	
	POHANG	
	SEOUL	
G586	YINGDE	
	ERTANG	
G587	TAIBEI	
	PABSO	2538.0N 12252.0E
	BULAN	2704.0N 12400.0E
G588	MOOREN	
	KHOVD	
	TEBUS	4725.1N 09027.7E
	TESAN	4701.7N 08947.8E
	FUKANG	
G590	SIMRA	
	VARANASI	
	KHAJURAHO	
	BHOPAL	
	INDORE	
	BODAR	2236.3N 07413.3E
G591	CAIRNS	
	NOUMEA	
	NORFORK IS	
	AUCKLAND	
G593	FUNAFUTI	
	NAUSORI	
	NIUE	
	RAROTONGA	

G594 TIAMU
TAHITI
RAROTONGA
AUCKLAND
SOLIT 2355.0S 07500.0E
(PLAISANCE)

G595 (TAHITI)
SYDNEY
MABAD 2648.4S 07500.0E
(PLAISNACE)

G597 DONVO 3734.0N 12320.0E
AGAVO 3710.0N 12400.0E
SEOUL
KANGNUNG
MIHO
OTSU
KOWA
OSHIMA
VENUS 3618.2N 14042.1E

G598 LUCKNOW
APIPU 2658.6N 08300.0E
SIMARU

G599 AUCKLAND
TAHITI

R200 PINGZHOU
LIANSHENGWEI
BIGRO
ZHANJIANG

R201 BANGKOK
UTAPAO

R202 PHRAE
TATEL 1729.1N 098 45.8E
(APAC13/07 – ATS)

R203 SAPAM 0804.6N 09733.0E
PHUKET

R204 KEITH 2100.0N 13456.5E
KALIN 0000.0N 14200.0E
LIDIT 0918.0S 14220.0E
HORN IS
CAIRNS

R205 ANARAK
BIRJAND

R206 PORT HEDLAND
CHRISTMAS IS
JAKARTA

R207 VIENTIANE
NAN
CHIANG MAI
MANDALAY

R208 KUALA LUMPUR
KUALA TRENGGANU
KANTO 0649.9N 10348.3E

R209 TATOX 0857.0N 09702.0E
LANGKAWI

R210 PORT MORESBY
CAIRNS

R211 KASMI 3601.3N 14040.3E
DAIGO
NIIGATA
KADBO 3914.0N 13745.4E
AVGOK 4336.0N 13815.0E
VELTA 4529.0N 13710.0E

R212 (DIEGO GARCIA)
GUDUG 0704.6S 07500.0E
PIBED 0520.2S 09044.0E

R215 CHIANG RAI
NAN
LUANG PRABANG

R217 NODAN 4025.0N 14500.0E
SENDAI
NIIGATA

R218 DELHI
DIPAS 2738.3N 07551.9E
JAIPUR

R220 DAIGO
IWAKI
NANAC 3854.2N 14313.9E
NIPPI 4942.6N 15920.8E
NODLE 6117.0N 15200.0W

R221 MERSING
PULAU TIOMAN

R222 AVGOK 4336.0N 13815.0E
(YEDINKA)

R223 BRUNEI
ELANG 0056.0S 11449.5E

R224 YANJI
VASRO 4227.8N 12944.4E
KANSU
(APAC 13/10 – ATS)

R325 KATHMANDU
JANAKPUR
DUMKA 2411.0N 08721.3E
KOLKATA
PHUKET
HAT YAI
IPOH
JOHOR BAHRU

R326 NORFOLK IS
CHRISTCHURCH

R327 GISBORNE
FAROA

R328 DANANG
HUE
LEBAL 1630.2N 10556.7E
SAVANNAKHET
(APAC 13/18 – ATS)

R329 KAGLU 1231.2N 07200.0E
MALE
GAN
(DIEGO GARCIA)

R330 SHEMYA
POWAL 5024.3N 16530.8E

R332 MAJURO
BONRIKI
AKUMO 0614.9S 17535.5E
ROTUMA
NADI

R334 RAYONG
KOH KONG
SIHANOUK
~~PADMA 1025.8N 10402.3E~~
PHU QUOC
(APAC 13/18 – ATS)

R335 VINH
ALPHA 1832.6N 10319.7E
VIENTIANE
(APAC 13/18 – ATS)

R336 ADAK
CARTO 4840.5N 16847.0E

R337 TACLOBAN
KOROR

R338 NOME
NINNA 5455.7N 17158.8E

R339 SIKOU 2050.6N 11130.0E
HUGUANG
NANNING
BOSE

R340 AMBON
WALGETT

R341 KODIAK
NINNA 5455.7N 17158.8E

R342 MANADO
BONDA 0200.0N 12451.2E
PEDNO 0400.0N 12521.0E
GENERAL SANTOS
DAVAO

R343 NANXIANG
WUXI
LISHUI
HEFEI
WUHAN
LONGKOU
LAOLIANGCANG
DARONGJIANG
LAIBIN
NANNING

R344 KATHMANDU
BIRATNAGAR
KATIHAR
RAJSHAHI

R345 ROIET
BIDEM
142153.57N 1034750.07E
SIEM REAP

R346 TOWNSVILLE
PORT MORESBY

R347 NIIGATA
SADO

	EKVIK	3944.7N 13636.5E
	IGROD	4139.0N 13647.0E
	(VELTA)	4529.0N 13710.0E
R348	KADAP	0200.0S 08409.6E
	LATEP	0610.3S 07500.0E
	(DIEGO GARCIA)	
R349	LEMOK	1000.0N 10302.2E
	RASER	1000.0N 10506.0E
	HO CHI MINH	
R450	KIETA	
	HONIARA	
R451	ADAK	
	OGDEN	4929.2N 16102.3E
R452	SONDO	3947.0N 12713.6E
	HAMUN	3955.1N 12731.1E
	KIMCHAEK	
	UAMRI	4217.6N 13041.8E
	(TEKUK)	4241.0N 13527.4E
R453	NADI	
	APIA	
R455	PONTIANAK	
	KUCHING	
R458	MUMBAI	
	EPKOS	1653.0N 07407.2E
	BELGAUM	
R457	CHENNAI	
	TIRUCHCHIRAPPALLI	
	MADUDAI	
	TRIVANDRUM	
	MALE	
R460	DELHI	
	ALIGARH	
	LUCKNOW	
	VARANASI	
	GAYA	
	KOLKATA	
R461	MUMBAI	
	MABTA	1708.5N 07321.8E
	BELGAUM	
	COIMBATORE	
	COLOMBO	
	MEDAN	
	KUALA LUMPUR	
R462	(SEEB)	
	DENDA	2442.5N 06054.8E
	JIWANI	
	KARACHI	
	UPAIPUR	
	DELHI	
R463	APACK	2402.6N 15619.2W
	ALCOA	3750.0N 12550.0W
R464	BITTA	2332.0N 15529.0W
	BEBOP	3700.0N 12500.0W
R465	CLUTS	2300.0N 15439.0W
	CLUKK	3605.0N 12450.0W
R467	KUALA LUMPUR	
	GUNIP	0429.9N 09931.9E
R468	BANGKOK	
	BOKAK	1257.5N 10230.0E
	PHNOM PENH	
	SAPEN	1102.2N 10611.0E
	HO CHI MINH	
R469	PEKANBARU	
	SINGAPORE	
R470	VIENTIANE	
	UDON THANI	
	KHON KAEN	
R472	KOLKATA	
	RAJSHAHI	
	GUWAHATI	
R473	LILING	
	NANXIONG	
	WONGYUANG	
	ZHULIAO	
	PINGZHOU	
	TAMOT	2221.5N 11352.0E
R474	GAOYAO	
	NANNING	
	LONGZHOU	
	HANOI	
	VIENTIANE	
	BANGKOK	
R575	PAPRA	1546.0N 10711.0E
	KOH KONG	
	UPNEP	0942.2N 10029.6E
	SURAT THANI	

R576	DENNS	2222.0N 15353.0W
	DINTY	3329.0N 12235.0W
R577	EBBER	2143.0N 15309.0W
	ELKEY	3241.0N 12203.0W
R578	FITES	2049.0N 15300.0W
	FICKY	3133.5N 12123.5W

(R579 in Chapter 2)

R580	OATIS	3800.0N 14345.0E
	OMOTO	4859.7N 16000.7E
	AMOTT	6053.9N 15121.8W
R581	KOLKATA	
	MONDA	2521.0N 08626.4E
	SIMARA	
R582	NORFOLK IS	
	RAROTONGA	
R583	TAIBEI	
	BISIS	2647.1N 12633.1E
	OKINAWA	
	MINAMIDAITO	
	SABGU	
	BUNGO	
R584	~~OKINAWA~~	
	AVLAS	
	SALVA	2222.7N 13059.7E
	KEITH	2100.0N 13456.48E
	GUAM	
	TRUK	
	POHNPEI	
	KWAJALEIN	
	MAJURO	
	JOHNSTON IS	
	CHOKO	2022.9N 16053.2E
	(APAC 13/09 – ATS)	
R585	CITTA	2818.9N 14507.2W
	GATES	3412.7N 12303.9W
R587	BRISBANE	
	PORT VILA	
R588	PHUKET	
	RELIP	
	PHNOM PENH	
	PLEIKU	
R590	AMBON	
	COTABATO	
R591	CAPE NEWENHAM	
	AKISU	4734.3N 16119.3E
	ABETS	3605.0N 14425.0E
R592	BALI	
	ONSLOW	
	PERTH	
R594	LUCKNOW	
	JALALABAD	
	DELHI	
R595	ANPU	
	MIYAKO JIMA	
	KEITH	2100.0N 13456.5E
	GUAM	
R597	CABANATUAN	
	SARSI	1642.0N 12316.9E
	SKATE	1716.7N 12423.0E
R598	KOLKATA	
	RAJSHAHI	
	SAIDPUR	
	COOCH BEHAR	
	BOGOP	
	PARO	
R599	KIETA	
	GIZO	
	HONIARA	
	PORT VILA	
	WHANGAREI	
	AUCKLAND	

RNAV ROUTES

L301	BANGKOK	
	DAWEI	
	VISHAKHAPATNAM	
	BUSBO	1914.9N 07807.6E
	NOBAT	2109.0N 06800.0E
	RASKI	2303.5N 06352.0E
	(VAXIM	2319.0N 06111.0E)
L333	KHAJURAHO	
	JAIPUR	
	TIGER	2828.8N 07214.9E
L500	(SANTIAGO)	

AUCKLAND

L501 (RIO GALLEGOS)
AUCKLAND

~~L502 ISLA DE PASCUA~~
~~(LOS ANGELES)~~
APAC 13/15 – ATM and SAM-B13/1 deleted as a result of Easter Island being transferred to SAM región

L503 BRISBANE
IGEVO 3636.5S 16300.0E
CHRISTCHURCH

L504 SINGAPORE
MANADO

L505 BUSBO 1914.9N 07807.6E
KAMOL 1938.1N 07340.0E
NOBAT 2109.0N 06800.0E

L507 KOLKATA
BAGO
BANGKOK

L508 RAROTONGA
CHRISTCHURCH
MELBOURNE

L509 GAYA
ASARI 3048.3N 07509.5E

L510 IBANI 250000N 0764311E
ELBAB 201333N 0815954E
LEKIR 071632N 0965243E
GIVAL 070000N 0980000E

L512 INTOS 3722.0N 13120.0E
NIIGATA

L513 PERTH
HOBART
AUCKLAND

L515 OBMOG 1154.1N 09623.5E
IKULA 1000.0N 09721.2E
PHUKET

L516 KITAL 2003.0N 06018.0E
ELKEL 0149.0N 06911.0E
(DIEGO GARCIA)

L517 MIRI
GULIB 0409.3N 11028.1E
TERIX 0415.4N 10934.9E

L518 HIA 171340.1N0782420.9E
BBZ 163118.3N0804733.7E
GOPNU 155112N0820224E
EGOLU 141858N0844952E
SADAP 120605.6N0884120.8E

L521 SYDNEY
AUCKLAND

L625 LUSMO 0333.7N 10655.7E
AKMON 0812.8N 11013.4E
ALDAS 1056.9N 11212.3E
ANOKI 1222.0N 11315.0E
ARESI 1358.4N 11427.0E
AKOTA 1706.6N 11651.6E
AVMUP 1843.3N 11808.3E
POTIB 2100.0N 12045.5E

L628 LUBANG
IBOBI 1354.4N 11832.6E
GUKUM 1356.8N 11637.2E
ARESI 1358.4N 11427.0E
MESOX 1358.4N 11427.0E
DAMEL 1358.7N 11130.6E
VEPAM 1358.0N 11000.0E
PHUCAT

L629 PEKAN
DOLOX 0448.7N 10522.9E

L635 PEKAN
MABLI 0417.3N 10612.9E

L637 BITOD 0715.3N 10612.9E
TANSONNHET

L642 CHEUNG CHAU
EPDOS 1900.0N 11333.3E
ENBOK 1833.4N 11329.5E
EGEMU 1700.0N 11217.0E
VEPAM 1358.0N 11000.0E
PHANTHIET
CONSON IS
ESPOB 0700.0N 10533.4E
ENREP 0452.4N 10414.8E
MERSING

L643 TANSONNHET
CONSON

L644 CONSON
JAKARTA

L645 COLOMBO
SULTO 0738.6N 08801.9E
SAMAK 0758.7N 09425.0E
SAPAM 0804.6N 09733.0E
PHUKET

L626 KATHUMANDU
ONISA 2858.1N 08005.5E
DELHI

L649 BRUNEI
ISKUD 0536.6N 11452.3E
URKET 0811.5N 11450.0E
LAXOR 0949.6N 11458.5E
(APAC 14/10 – ATS)

L756 CLAVA
MALE

L759 DELHI
POSIG 2713.0N 07734.9E
AGRA
KHAJURAHO
PHUKET

L760 AGRA
GURTI 2743.8N 07747.8E
DELHI

L774 (PLAISANCE)
LELED 116.5S 07500.0E
ELATI 0200.0S 08957.7E
KETIV 0042.0S 09200.0E
MEDAN

L875 VUTAS 091206N 0600004E
MOXET 110146N 0645024E
GOLEM 115739N 0672213E
EGOGI 121100N 0690000E
GOKUM 122025N 0701005E
OLNIK 122850N 0711440E
BEDIL 123500N 0715958E
DOLPI 124641N 0732711E
MANGALORE(MML)

PEXEG 130415N 0760230E
BANGALORE (BIA)
CHENNAI (MMV)
(APAC13/08-ATS)

~~L888 BIDRU 2243.1N 10057.9E~~
~~NIVUX 2600.0N 10000.0E~~
~~SANLI 3200.0N 10000.0E~~
~~TEMOL 3527.1N 09412.2E~~
~~TONAX 3745.5N 09011.3E~~
~~KUCA VOR (KCA)~~

L888 BIDRU 22 43.1N 100 57.9E
MAKUL 24 03.1N 100 34.6E
NIVUX 26 00.0N 100 00.0E
PEXUN 30 55.9N 100 00.0E
SANLI 32 00.0N 100 00.0E
NOLEP 38 34.5N 088 42.5E
SADAN 40 04.6N 086 00.0E
KUQA VOR (KCA)
(APAC 13/13 – ATS)

L894 KITAL 2003.0N 06018.0E
MALE
SUNAN 0028.7S 07800.0E
DADAR 0200.0S 07927.1E
PERTH

L896 SAPDA 1200.0S 11125.6E
NISOK 0302.9N 09200.0E
DUGOS 0853.1N 08447.9E
CHENNAI

L897 CHRISTMAS ISLAND
KETIV 0042.0S 09200.0E
COLOMBO

L899 HANIMAADHOO
TRIVANDRUM

M300 (EMURU 2215.6N 05849.8E)
LOTAV 2037.0N 06057.0E
CALICUT
MADURAI
SALAX 0212.4N 10133.7E

M501 GUAM
LIMLE 1639.7N 13000.0E
SKATE 1722.2N 12425.6E
LAOAG
NOMAN 2000.0N 11640.3E

M502 BANGKOK

AKATO 1337.3N 09910.3E
LALIT 1252.4N 09225.1E

M504 ALPOR 2404.7N 06120.0E
NODER 2350.0N 06700.0E
TELEM 2402.0N 06846.0E

M505 BUON MA THUOT
MONDULKIRI
SIEM RIEP

M510 CAN THO
PHNOM PENH

M512 COLOMBO
ANIVE 0540.9N 07800.0E
MALE

M520 SERNA 5018.5N 10628.1E
POLHO 4447.0N 11315.0E

M522 VINIK 0838.5N 11613.8E
KOTA KINABALU
MAMOK 0405.1N 11547.2E
DENPASAR

M625 MELBOURNE
WELLINGTON

M626 KOTA BHARU
DAWEI
BAGO

M635 **SINGAPORE**
RAMPY 0615.0 11320.8E
CURTIN

M638 DOSTI 2558.0N 06503.0E
KARACHI
MINAR 2350.0N 06800.0E
SAPNA 2330.0N 06750.0E
NOBAT 2109.0N 06800.0E
MUMBAI

M639 IGEVO 3636.5S 16300.0E
WELLINGTON

M641 MADURAI
BIKOK 0817.0N 07836.0E
COLOMBO
COCOS IS
PERTH

M643 HOBART
CHRISTCHURCH

M644 RAYONG
KOTA BHARU

M646 HENGCHUN
AGVAR 1924.8N 12037.7E
LAOAG
SAN FERNANDO
MANILA
TOKON 1142.0N 11940.5E
PUERTO PRINCESAKOTA
KINABALU
BRUNEI
DARMU 0401.7N 11240.6E
KAMIN 0234.7N 10855.9E
SABIP 0209.7N 10750.7E
ESPIT 0200.2N 10726.4E
OBLOT 0142.9N 10641.8E
TOMAN 0121.8N 10547.3E
(APAC 13/22- ATS)

M750 KILOG 2152.5N 11441.6E
ENVAR 2159.5N 11730.0E
MOLKA 2639.5N 12400.0E
MOMPA 3050.5N 12955.1E
~~MANEP 3242.9N 13340.0E~~
~~SOPHY 3327.2N 13721.9E~~
~~MIYAKE JIMA~~
BUNGU 3407.1N 13929.9E
(APAC 14/01 – ATS)

M751 MERSING
PEKAN
KOTA BHARU
REGOS 1200.0N 10035.1E
BANGKOK

M753 ENREP 0452.4N 10414.8E
BITOD 0715.3N 10407.3E
PHU QUOC
~~CAMPU 1030.0N 10402.3E~~
PHNOM PENH

APAC13/18 - ATS

M754 BRUNEI
VINIK 0838.6N 11613.8E
TENON 0915.3N 11616.5E
LULBU 1104.7N 11624.4E
NOBEN 1234.4N 11631.1E
GUKUM 1356.8N 11637.2E
AKOTA 1706.6N 11651.6E

M755 PHNOM PENH
KISAN 1032.3N 10440.5E
BITOD 0415.4N 10407.1E

M758 PEKAN
LUSMO 0333.7N 10655.7E
TERIX 0415.4N 10934.7E
OLKIT 0450.1N 11149.1E
KOTA KINABALU

M759 OLKIT 0450.1N 11149.1E
BRUNEI

M761 PEKAN
BOBOB 0222.1N 10706.1E
SABIP 0209.7N 10750.5E
AGOBA 0158.7N 10830.0E
KUCHING

M766 COLOMBO
JAKARTA
INDRAMAYU
MADIN 0617.9S 11023.0E
CUCUT 0617.7S 11106.0E
SURABAYA
BALI
DARWIN

M765 KOTA BHARU
IGARI 0656.2N 10335.2E
BITOD 0715.3N 10407.3E
CONSON
DAGAG 0927.8N 10826.5E
MAPNO 1013.1N 11020.1E

M767 JOMALIG
TOKON 1142.0N 11940.3E
TENON 0915.3N 11616.5E
TEGID 0857.2N 11551.6E
TODAM 0631.7N 11235.4E

M768 DARWIN
BRUNEI
DOGOG 0525.3N 11407.5E
ASISU 0559.1N 11320.8E
TODAM 0631.6N 11235.6E
LAGOT 0716.5N 11132.7E
AKMON 0812.9N 11013.1E
MOXON 0849.5N 10921.3E
DAGAG 0927.8N 10826.5E
TANSONNHAT

M770 KOTA BHARU
RANONG
BUBKO 1911.1N 08839.8E
KAKID 2038.6N 08659.9E
JAMSHEDPUR

M771 MERSING
DOLOX 0448.7N 10522.9E
DUDIS 0700.0N 10648.6E
DAGAG 0927.8N 10826.5E
DOXAR 1222.0N 11022.7E
DAMEL 1358.7N 11130.6E
DONDA 1442.2N 11201.3E
DOSUT 1702.0N 11340.8E
DULOP 1814.2N 11432.6E
DUMOL 1900.0N 11426.8E
HONG KONG

M773 BUBKO 1911.1N 08839.8E
LEGOS 2138.0N 08805.3E
KOLKATA

M774 SINGAPORE
KIKEM 0952.9S 12607.4E

M875 KAKID 2038.6N 08659.9E
BUTOP 2919.7N 07523.9E
GUGAL 3014.5N 07358.0E
DERA ISMAIL KHAN

M890 LUCKNOW
CHANDIGARH
SAMAR 3120.8N 07434.0E

M904 BANGKOK
U-TAPHAO
DIPUN
SIRAT
TONIK
TIDAR
ODONO
UPRON
ENREP

N502 PARDI 0034.0S 10413.0E
BOBAG 0102.5N 10329.9E

N509 ELATI 0200.0S 08957.7E
PORT HEDLAND

N519 MUMBAI
SAPNA 2330.0N 06750.0E
MINAR 2350.0N 06800.0E
KARACHI

N563 (EMURU 2214.0N 05853.6E)
REXOD 2112.5N 06138.5E
BANGALORE
MEDAN
SALAX 0212.4N 10133.7E

N564 DUGOS 0853.1N 08447.9E
AKMIL 1151.6N 08006.9E

N571 (RAGMA 2306.0N 06105.7E)
PARAR 2226.5N 06307.0E
VAMPI 0610.9N 09735.1E
GUNIP 0429.9N 09931.8E

N628 PEKANBARU
BUSUX 0355.0S 06000.0E
(PRASLIN)

N633 KUALA LUMPUR
PEKANBARU
POSOD 0329.5S 09409.9E
PEDPI 1316.6S 07500.0E
(PLAISANCE)

N640 TRIVANDRUM
BIKOK 0817.0N 07836.0E
COLOMBO
LEARMONTH
MOUNT HOPE
ADELAIDE

N645 BRUNEI
ELANG
005535.64S 1145003.10E
SURABAYA

N750 SYDNEY
CHRISTCHURCH

N759 MELBOURNE
AUCKLAND

N774 AUCKLAND
SYDNEY

N875 DENPASAR
PONTIANAK
ARUPA 0031.7N 10848.8E
NIMIX 0124.9N 10759.4E
BOBOB 0222.1N 10706.0E
ENREP 0452.4N 10414.7E

N877 LAGOG 0835.6N 09159.8E
VISHAKHAPATNAM
NAGPUR
PRATAGRAPH

N884 MERSING
LUSMO 0333.7N 10655.7E
LAGOT 0716.6N 11131.5E
LAXOR 0949.6N 11448.5E
LULBU
110936.07N 1163217.70E
LEGED
130113.24N 1190006.94E
LUBANG
CABANATUAN
MIYAKOJIMA

N891 PAPA UNIFORM
ENREP 0452.4N 10414.8E
IGARI 0656.2N 10335.2E
SAMOG 0800.0N 13014.6E
RAYONG
BANGKOK

N892 HENGCHUN
KABAM 2100.0N 11925.7E
MUMOT 1930.4N 11714.5E
MAVRA 1814.4N 11615.1E
MIGUG 1516.4N 11400.0E
MESOX 1358.8N 11302.7E
MUGAN 1222.0N 11152.3E
MAPNO 1013.1N 11020.1E
MOXON 0849.5N 10921.3E
MELAS 0704.9N 10808.4E
MABLI 0417.3N 10612.9E
MERSING

N893 TELEM 2407.0N 06846.0E
AHMEDABAD

N895 BETNO 1505.8N 09812.7E
PATHEIN
BHUBANESWAR
NAGPUR

BODAR 2236.3N 07413.3E
AHMEDABAD
PARTY 2414.6N 07052.0E

P173 TAPIS 3431.0N 06909.0E
DAVET 3657.6N 06447.2E
(APAC 14/11 – ATS)

P501 ARAMA 0136.9N 10307.2E
BOBAG 0102.5N 10329.9E
ANITO 0017.0S 10452.0E

P518 NOBAT 2109.0N 06800.0E
PARET 2527.2N 06451.5E
PANJGUR

P570 (MIBSI 2341.7N 05755.4E)
KITAL 2003.0N 06018.0E
TRIVANDRUM
KATUNAYAKE
PEKANBARU

P574 (KUSRA)
TOTOX 2150.5N 06222.5E
BISET 1823.4N 06918.1E
BELGAUM
CHENNAI
PUGER 0324.0N 10017.5E

P627 PHUKET
KADAP 0200.0S 08409.6E
KALBI
(PLAISANCE)

P628 LANGKAWI
PORT BLAIR
RAHIM YAR KHAN

P646 BANGKOK
JAMSHEDPUR
PATHEIN
VARANASI

P648 KOTA KINABALU
JAKARTA

P751 (ADEN)
ANGAL 1614N 06000E
MUMBAI

P756 MALE
MEDAN

P761 CHENNAI
PORT BLAIR

P762 DAWEI
PORT BLAIR
COLOMBO

P880 IGEVO 03636.29S 16300.00E
SLOPE HILL VOR
04459.03S 16846.57E

P901 IKELA 1839.7N 11214.7E
CHEUNG CHAU

UPPER ATS ROUTES

UB467 YEDINKA
VELTA 4529N 13710E
TEKUK 4241N 13527.4E
NULAR 4059.2N 13411E
(KANSU) 3838.0N 13228.5E

UL425 (KUTVI)
ASPUX 1744.00N 06000.00E
DONSA 1434.14N 06511.32E
VANVO 1043.00N 07200.00E

UM551 DONSA 1435.3N 06511.6E
ANGAL 1614.1N 06000.1E
(AVAVO) 1646.3N 05526.1E

Note1: Acronyms used for route names are only intended as a rough guide to the location of the routes. They are explained below:

IND - India
SEA - South East Asia
SCS - South China Sea
PHI - Philippines
THA - Thailand
TPE - Taipei
PRD - Pearl River Delta
KAB - Kabul
IDO - Indonesia
COL - Colombo
CHA - China
IATA - earlier IATA requested routes in China
WPC - West Pacific Area

Note 2: Route names in parenthesis refer to the original names from an earlier route catalogue. They are renamed following consolidation of China routes and ARNR TF 3 meeting.

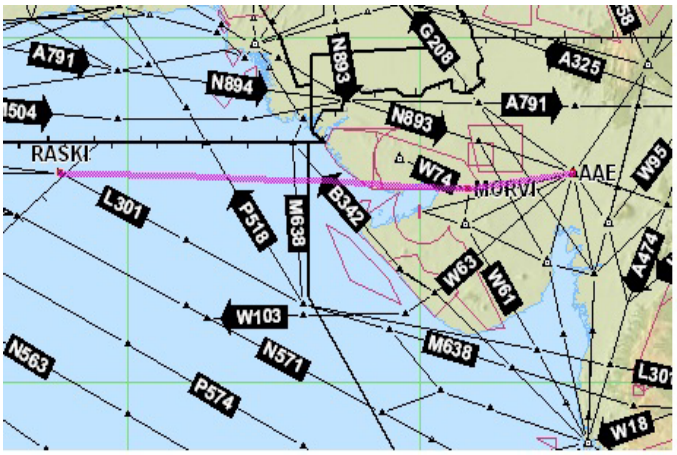
Chapter 1: South Asia

(referred to: SAIOACG, BOBASIO, ASIOACG as appropriate for review)

ATS ROUTES	SIGNIFICANT PTS	COORDINATES	FIR	REMARKS
IND 1	BBS BPL	N2014.6 E08548.8 N2317.0 E07720.2	KOLKATTA MUMBAI	
IND 7	PRA SERKA KAMAR BIRJAND	N2401.8 E07445.0 N2951.0 E06615.0 N3239.0 E06044.0 N3258.3 E05912.0	MUMBAI DELHI KABUL TEHERAN	N877 Extension
IND 09	TELEM BHU RKT BBB	N2407 E068 46 N2316.5 E06940.0 N2218.8 E07046.7 N1905.2 E072 52.5	MUMBAI	New Entry 1/1/13
IND 10	AAE MORVI RASKI	N2304.1 E07237.7 N2249.0 E07050.0 N2303.5 E06352.0	MUMBAI	New Entry 1/1/13
PAK 01	KC MELOM	N2454.6 E06710.6 N2505.0 E06632.0	KARACHI	New Entry 1/1/13
PAK02	INDEK CHG	N3246.0 E07316.0 N3040.1 E07648.3	LAHORE DELHI	New Entry M890 extension 1/1/13
THA 1	KORAT DAWEI	N1455.0 E10208.4 N1405.9 E09812.2	BANGKOK YANGON	
IDO 1	SJ MABIX	N0113.4 E10351.3 N0316.0 E09450.9	SINGAPORE JAKARTA	
COL 1	KAT TNV	N0709.7 E07952.1 S1842.2 E04731.1	COLOMBO MADAGASCAR	
IND 8	VABB APANO WPT “X”	Details in chart	MUMBAI KARACHI	2 Route Options
HIMALAYA 1	KOLKATA NEPALGUNJ INDEK	2238.7N 08827.2E 2806.1N 08139.1E 3246N 7316E	KOLKATA KATHMANDU LAHORE	Moved from Chapter 4. Route requested by Nepal
HIMALAYA 2	KATHMANDU BAGHDOGRA GUWAHATI SILCHAR IMPHAL KUNMING	2740.5N 08521.0E 2641.3N 08819.8E 2606.1N 09135.3E 2454.8N 09258.9E 2446.0N 09354.5E 2501N 10244E	KATHMANDU KOLKATA KOLKATA KOLKATA KOLKATA KUNMING	Moved from Chapter 4. Route requested by Nepal
HIMALAYA 3	**LELAX QIM FKG**	N3223.5 E07737.9 N3809.1 E08532.2 N4410.0 E08759.0	DELHI URUMQI	New Entry 10/1/13

IRAN1	**a. ALROT-BIRJAND-SOKIR-NH** **b. ALROT-BIRJAND-SOKIR-GASIR**	?	IRAN KABUL PAKISTAN	Requested by IRAN and amended by IATA at SAIAOCG/3 Mtg.
P173	**TAPIS – DAVET westbound only**		Turkmenistan Afghanistan	RDGE14.026 Implementation date 01 SEP 2014

ATS ROUTE NAME: *IND10*	
REQUESTED BY: IATA	Date: 01/01/2013

ENTRY/EXIT POINT AAE- RASKI **ROUTE DESCRIPTION** **AAE (Ahmadabad) – MORVI- RASKI** **FLIGHT LEVEL BAND** **29000 – 46000** **PRIORITY:** **HIGH/MED/LOW** **HIGH**	**CHART** 

Action Required	IATA
	ICAO

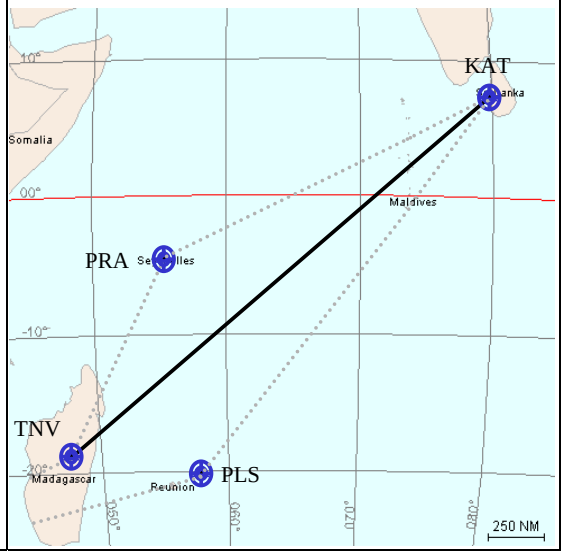
Saving	Per flight	Annual potential
Mileage / Time	80 nm / 9min	
Fuel	765 Kg	8,800 Ton
CO_2	2409 kg	27,700 Ton
No_x		
SO_2		

Remarks: Facilitates From / To Ahmadabad Middle East and overflying traffic between Far East Asia to Middle East.

Potential City Pairs: AMD, DAC, HKG, PVG, BJS / Middle East

ATS ROUTE NAME: COL 1

REQUESTED BY: IATA

ENTRY/EXIT POINT **KAT / TNV** **ROUTE DESCRIPTION** **KAT .. TNV (ANTANANARIVO)** **FLIGHT LEVEL BAND** **28000 – 46000 feet** **PRIORITY: HIGH/MED/LOW**	**CHART** 

Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time	130nm /16 min	
Fuel	2110kg	770,000kg
CO_2	6,500kg	2,370 tonnes
No_x		

Remarks: This proposal supports traffic between THA/HKG/ South China and Southern Africa. A proposal already exists to establish a User Preferred Route (UPR) geographic area which will support the same traffic flow however this proposal needs to be retained in the short term.

Potential City Pairs:

ATS ROUTE NAME: *Himalaya 3*

REQUESTED BY: IATA Date: 10 January 2013

ENTRY/EXIT POINT
LELAX-QIM-FKG
(Or LELAX-QIM-POSOT-FKG)

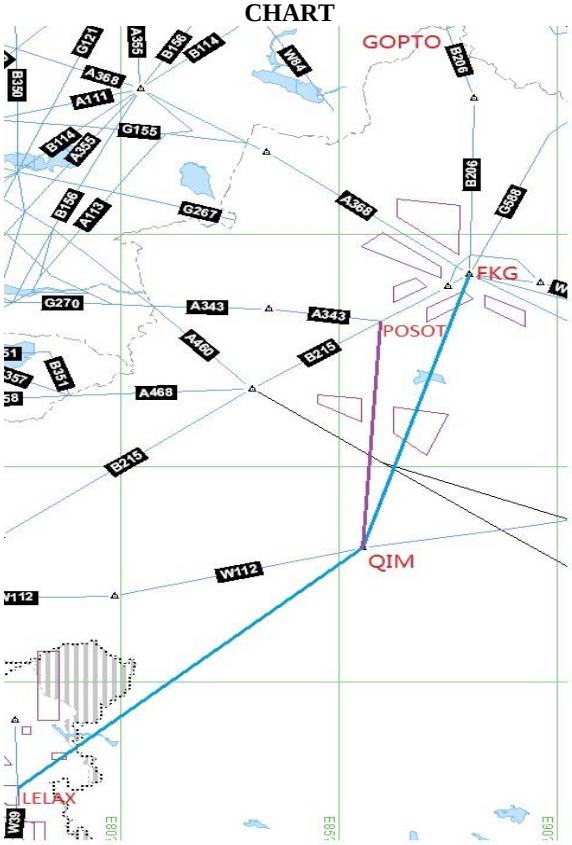
Connecting to FKG-TAI-GOPTO-LANBI

ROUTE DESCRIPTION
LELAX direct to QIM over the Himalaya to support a new route from India into China connecting to Russia onwards polar / trans polar gateways.

FLIGHT LEVEL BAND:

PRIORITY:
HIGH

CHART



Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time	257NM / 23 mins	
Fuel	3500 kgs	1,265 Ton
CO_2	11 Tons	4,000 Ton
No_x		

Remarks: New 787 aircraft equipped with more than the standard cabin oxygen supply capable of operating at higher altitude longer in the event of depressurization over the Himalayas.

Potential City Pairs: India -North America

ATS ROUTE NAME: IRAN 1

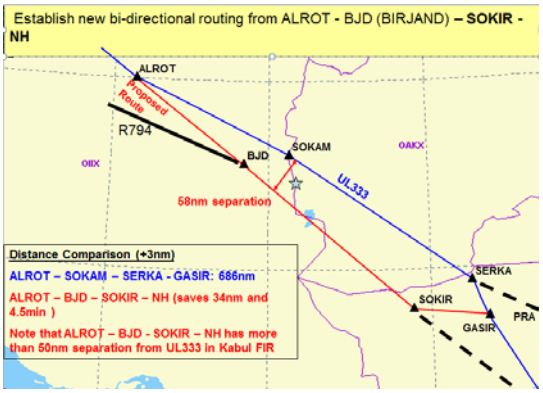
Requested by : Iran

ENTRY/EXIT POINT
XXXXX

ROUTE DESCRIPTION
a. ALROT-BIRJAND-SOKIR -NH
b. ALROT-BIRJAND-SOKIR-GASIR

FLIGHT LEVEL BAND

PRIORITY: HIGH/MED/LOW



CHART

Action Required	States to coordinate imeplementation.
	.

Benefit		
Cost		
Fuel Saving		
Emission	CO_2	
	NO_X	

Remarks: Requested bu IRAN and amended by IATA at SAIOACG /3 meeting.

ATS ROUTE NAME: RDGE 14.026 Requested by : TKM

ENTRY/EXIT POINT **ROUTE DESCRIPTION** Implementation of uni-directional westbound ATS route: **P173 TAPIS - DAVET** **FLIGHT LEVEL BAND** 31000 – 43000 ft **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE** 01 September 2014	**CHART**

Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks:

Potential City Pairs:

Chapter 2: Southeast Asia

(referred to: SEACG for review)

ATS ROUTES	SIGNIFICANT PTS	COORDINATES	FIR	REMARKS
SEA 2	DANANG SYX	N1603.2 E10811.9 N1818.4 E10910.4	HOCHIMINH SANYA	
SEA 6	PAKSE ASSAD	N1511.8 E10544.5 N1820.5 E10740.9	VIENTIANE ASSAD	
SEA 10	LENKO QUNGI SAMUI	 N1507.0 E10848.0 N0932.8 E10003.7	SANYA HOCHIMINH PNOMPENH BANGKOK	New chart provided by IATA QUNGI-LENKO
SEA 12	ROT HUGUANG	N1607.0 E10346.7 N2107.9 E11020.2	HOCHIMINH GUANGZHOU	
SCS1	DAMEL CH	N1358.7 E11136.4 N2213.2 E11401.8	HOCHIMINH HONGKONG	
SCS 2	VEPAM CH	N1358.0 E11000.0 N2213.2 E11401.8	HOCHIMINH HONGKONG	
SCS 4	VKL CONSON	N0243.5 E10144.3 N0843.8 E10637.9	LUMPUR HOCHIMINH	
SCS 5	EXOTO DAMVO MELAS LUSMO	N1521.5 E11103.0 N1106.5 E10932.7 N0705.3 E10809.2 N0333.7 E10655.6	HOCHIMINH HOCHIMINH HOCHIMINH SINGAPORE	
SCS 7	BRUNEI LAXOR DULOP	N04 52.5E11453.1 N0949.6 E11448.5 N1814.2E11432.6	KINABALU SINGAPORE HONGKONG	TO JOIN M772 AT LAXOR
SCS8	DULOP ELATO ENVAR DULOP KAPLI	N1814.2E11432.6 N2220.0 E11730.0 N2159.5 E11730.0 N1814.2E11432.6 N2110.0 E11730.0	HONGKONG HONGKONG HONGKONG HONGKONG HONGKONG	EITHER DULOP/ KAPLI G86, OR DULOP/ ELATO& ENVAR
Unnamed	NOIBAI KUNMING	2112.8N 10550.1E 2501.0N 10244.0E	HANOI KUNMING	Moved from Chapter 4. Route Requested by Vietnam
Unnamed	NOIBAI CATBI SAMAS OR HUGUANG	2112.8N 10550.1E 2049.1N 10642.5E 2030.3N 11029.7E 2107.9N 11020.2	HANOI HANOI GUANGZHOU/ SANYA GUANGZHOU	Moved from Chapter 4. Route Requested by Vietnam

SCS10	PHUCAT ASISU		HO CHI MINH SINGAPORE KOTA KINABALU	
PHI 5	ENDAX VJN		MANILA	
SEA 5	STUNG TRENG DANANG	N1331.5 E10600.9 N1603.2 E10811.9	PNOMPENH HOCHIMINH	Moved from Chapter 5 part A
SCS9	TOKON DILIS TOKON ENDAX	N1142.0 E11940.5 N1431.1 E12600.1 N1142.0 E11940.5 N1415.0 E13000.0	MANILA MANILA MANILA MANILA	Moved from Chapter 5 part A

ATS ROUTE NAME: SEA2

REQUESTED BY: IATA

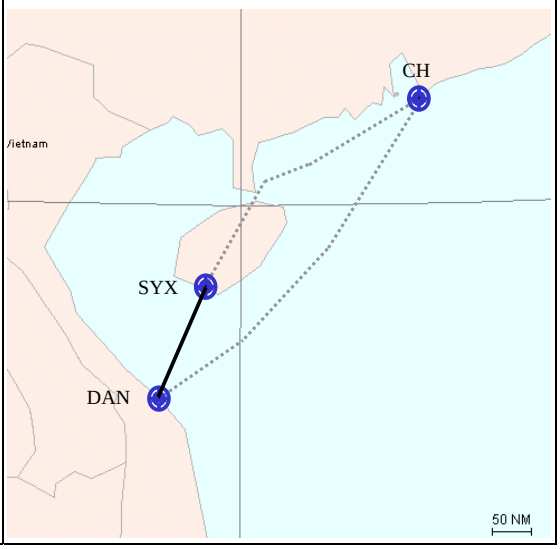
ENTRY/EXIT POINT
DAN / XXXXX / SYX

ROUTE DESCRIPTION
DAN .. SYX

FLIGHT LEVEL BAND
29000 – 46000 feet

PRIORITY: HIGH/MED/LOW

CHART



Action Required	IATA
	ICAO

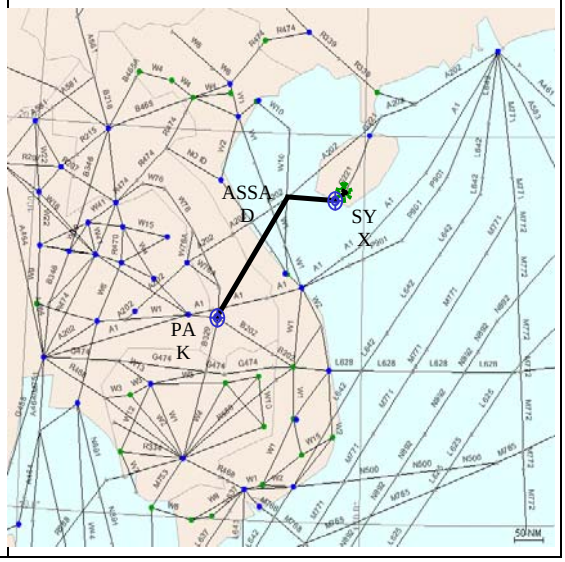
Saving	Per flight	Annual
Mileage / Time	739nm/93 mins	
Fuel	12090 kg	4,412 tonnes
CO_2	37200kg	13,578 tonnes
No_x		

Remarks: Supports traffic Southeast Asia – Haian Island and possible alternative routing for the Pearl River Delta area.

Potential City Pairs: South East Asia - Hainan

ATS ROUTE NAME: SEA 6

REQUESTED BY: IATA

ENTRY/EXIT POINT **PAKSE - ASSAD** **ROUTE DESCRIPTION** **Direct PAKSE to ASSAD** **FLIGHT LEVEL BAND** **29000 – 46000 feet** **PRIORITY: HIGH/MED/LOW** **MED**	**CHART** 

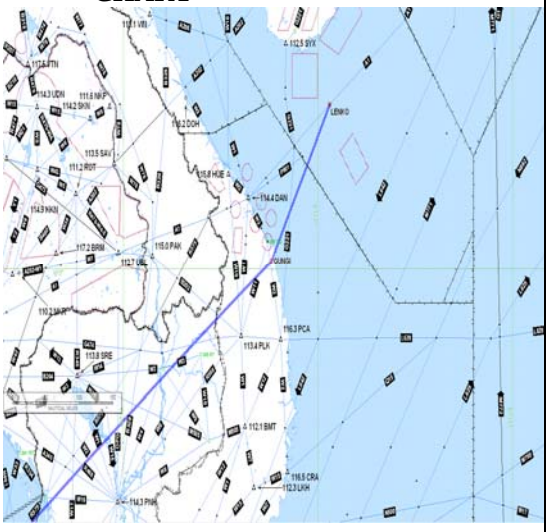
Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time	126 nm / 16 min	
Fuel	2047 kg	747.338 kg
CO_2	6300 kg	2299,500 kg
No_x		

Remarks: Supports traffic Southeast Asia – the Perl River Delta area/South China.

Potential City Pairs: KUL/SIN/Phnom Penh/JKT – Hainan/ Hong Kong

ATS ROUTE NAME: SEA 10 Alternative route proposed from QUNGI to LENKO by IATA at SEACG/20 mtg REQUESTED BY: IATA

ENTRY/EXIT POINT **XXXXX** **ROUTE DESCRIPTION** **~~CAVOI and IGNIS~~ LENKO ..** **Quangngai/QUNGI .. SAMUI (SMU)** **FLIGHT LEVEL BAND** **28000 – 46000 feet** **PRIORITY: HIGH/MED/LOW**	**CHART** 

Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: Supports traffic from Northeast Asia to Phuket and beyond. Will require linkages to/from QUNGI as original proposed points CAVOI and IGNIS no longer exist. **IATA propose to link QUNGI to LENKO**

Potential City Pairs: Colombo/ Phuket - Pearl River Delta

ATS ROUTE NAME: SEA 12

REQUESTED BY: IATA

ENTRY/EXIT POINT
ROT - HUGUANG

ROUTE DESCRIPTION

Direct ROT - HUGUANG

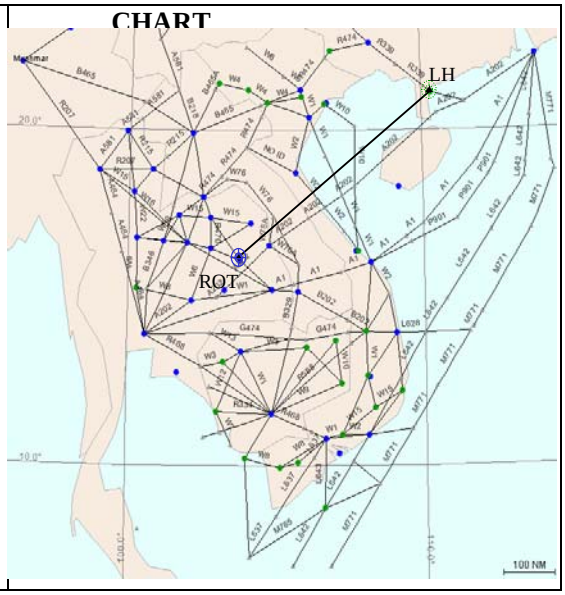
FLIGHT LEVEL BAND

29000 - 46000

PRIORITY: HIGH/MED/LOW

HIGH

CHART



Action Required	IATA
	ICAO

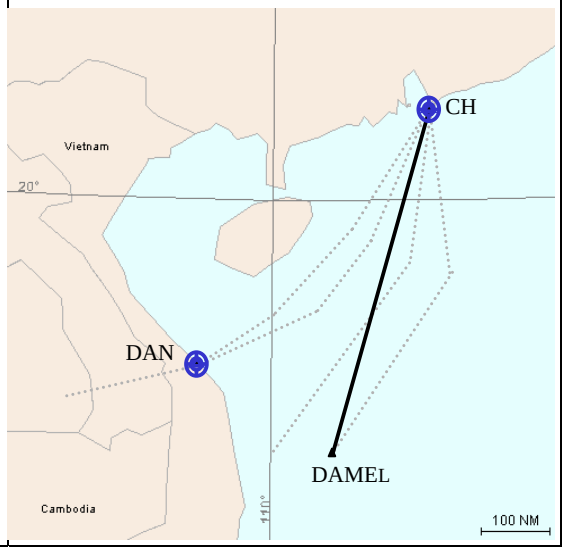
Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: Provide parallel to the A202 route similar to proposal for uni-directional routes proposed through Southeast Asia Route Review Task Force.

Potential City Pairs: KUL/SIN/Phnom Penh/JKT – SANYA/HKG

ATS ROUTE NAME: SCS1

REQUESTED BY: IATA

ENTRY/EXIT POINT **DAMEL / CH** **ROUTE DESCRIPTION** **DAMEL .. CH** **FLIGHT LEVEL BAND** **28000 – 46000 feet** **PRIORITY: HIGH/MED/LOW**	**CHART** 

Action Required	IATA
	ICAO

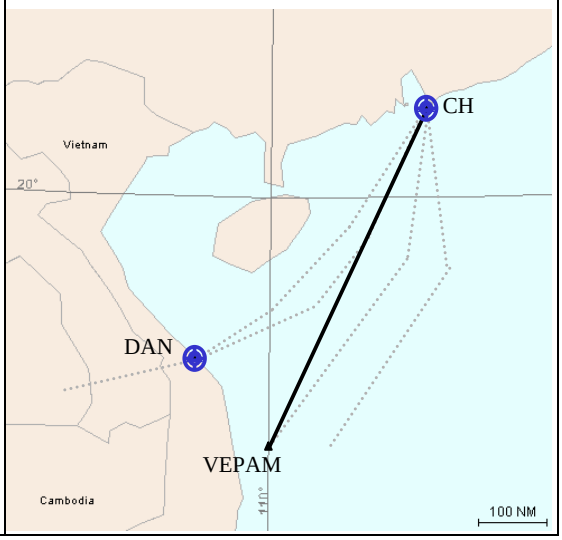
Saving	Per flight	Annual
Mileage / Time	35nm / 4mins	
Fuel	568kg	207594kg
CO_2	1750kg	638,750kg
No_x		

Remarks: Proposed route shortening for M771 into the Pearl River Delta area. Similar proposals have been made through Southeast Asia Route Review Task Force. During SEACG/19 in WP09 Hong Kong China advised they had studied the proposal for track shortening and advised the proposed change would reduce capacity of A1/P901. It would also require an extensive change in the flight route system and ATC sectors in Hong Kong FIR. However Hong Kong, China would continue to study this proposal for the implementation of RNP4/2. . **(IATA – 5/02/2013- Remains as high priority in view of the savings impact for many airlines)**

Potential City Pairs: Singapore-Pearl River Delta Airports

ATS ROUTE NAME: SCS2

REQUESTED BY: IATA

ENTRY/EXIT POINT **CH / VEPAM** **ROUTE DESCRIPTION** **CH .. VEPAM** **FLIGHT LEVEL BAND** **28000 – 46000 feet** **PRIORITY: HIGH/MED/LOW**	**CHART** 

Action Required	IATA
	ICAO

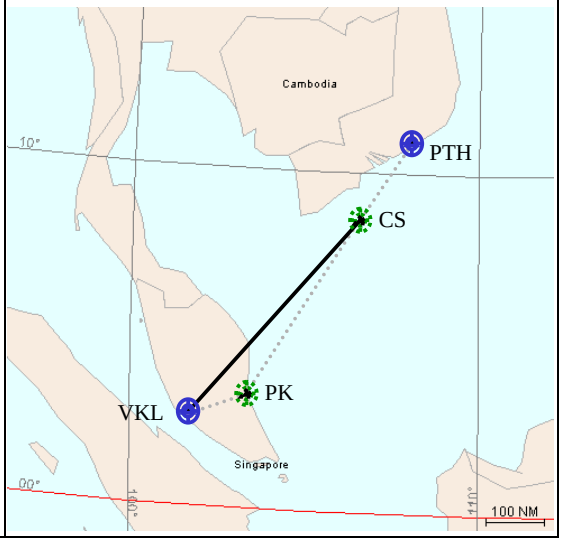
Saving	Per flight	Annual
Mileage / Time	17nm/ 2 mins	
Fuel	276kg	100,831kg
CO_2	850kg	310,250kg
No_x		

Remarks: Proposed route shortening for L642 out of the Pearl River Delta area. Similar proposals have been made through Southeast Asia Route Review Task Force. During SEACG/19 in WP09 Hong Kong China advised they had studied the proposal for track shortening and advised the proposed change would reduce capacity of A1/P901. It would also require an extensive change in the flight route system and ATC sectors in Hong Kong FIR. However Hong Kong, China would continue to study this proposal for the implementation of RNP4/2 ...**(IATA - 5/01/2013 - Remains as high priority in view of the savings impact for many airlines)**

Potential City Pairs: Singapore-Pearl River Delta Airports

ATS ROUTE NAME: SCS4

REQUESTED BY: IATA

ENTRY/EXIT POINT **CS / VKL** **ROUTE DESCRIPTION** **CS .. VKL** **FLIGHT LEVEL BAND** **28000 – 46000 feet** **PRIORITY: HIGH/MED/LOW**	**CHART** 

Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time	18nm / 2.25 mins	
Fuel	292kg	106,763kg
CO_2	900kg	328,500kg
No_x		

Remarks: Supports traffic to and from Kula Lupur from and to the northeast.

Potential City Pairs: Kuala Lumpur-Pearl River Delta Airports

ATS ROUTE NAME: SCS5

REQUESTED BY: IATA

ENTRY/EXIT POINT **EXOTO / MELAS / LUSMO** **ROUTE DESCRIPTION** **EXOTO .. DAMVO .. MELAS .. LUSMO** **FLIGHT LEVEL BAND** **28000 – 46000 feet** **PRIORITY: HIGH/MED/LOW**	**CHART** 

Action Required	IATA
	ICAO

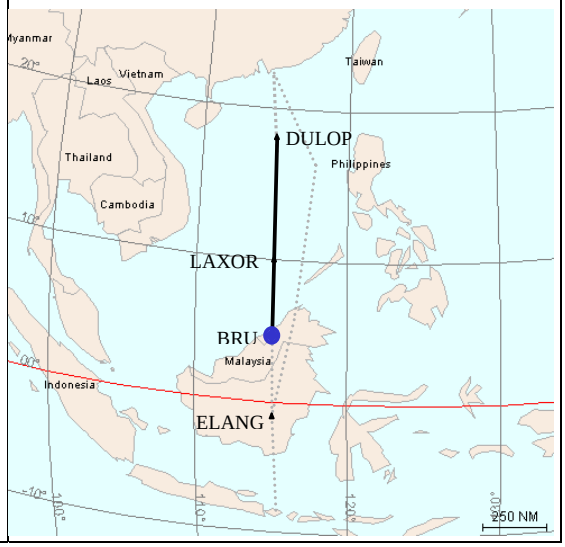
Saving	Per flight	Annual
Mileage / Time	76nm/ 9.5 mins	
Fuel	1235kg	450,775kg
CO_2	3800kg	1,387 tonnes
No_x		

Remarks: Need to be considered in conjunction with developments with L642/M771 and possibly South China Sea ADS-B project.

Potential City Pairs: Jakarta- Pearl River Delta Airports

ATS ROUTE NAME: SCS7

REQUESTED BY: IATA

ENTRY/EXIT POINT **DULOP/ M772 / LAXOR / XXXXX / BRU** **ROUTE DESCRIPTION** **DULOP M772 LAXOR .. XXXXX .. BRU** **FLIGHT LEVEL BAND** **28000 – 46000 feet** **PRIORITY: HIGH/MED/LOW**	**CHART** 

Action Required	IATA
	ICAO

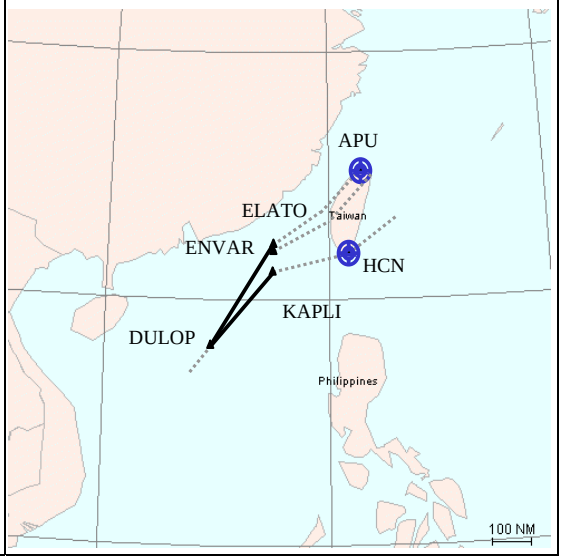
Saving	Per flight	Annual
Mileage / Time	60nm/ 7.5mins	
Fuel	975kg	355,875kg
CO_2	3000kg	1,095 tonnes
No_x		

Remarks: Supports traffic from Perth, eastern Malaysia and eastern Indonesia to the Perl River Delta area, China. Segment DULOP and LAXOR exists as M772.

Potential City Pairs: Pearl River Delta Airports-Bali/ Surabaya/ Perth

ATS ROUTE NAME: SCS 8

REQUESTED BY: IATA

ENTRY/EXIT POINT	CHART
1. DULOP / ELATO(ENVAR) **2. DULOP / KAPLI** **ROUTE DESCRIPTION** **DULOP .. ELATO (A1)/ENVAR (M750) or** **DULOP .. KAPLI (G86)** **FLIGHT LEVEL BAND** **28000 – 46000 feet** **PRIORITY: HIGH/MED/LOW**	

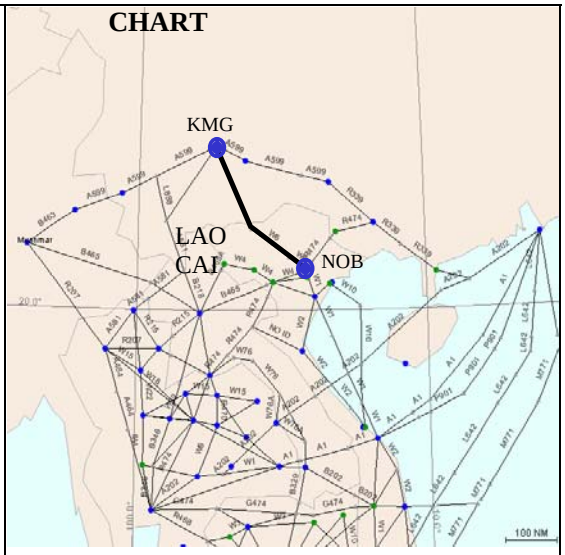
Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time	a.DULOP/ENVAR 140nm/17.5min b.DULOP/KAPLI 238nm/ 30min	
Fuel	a.2275kg b.3867kg	a.830,000kg b.1,411 tonnes
CO_2	a. 7000kg b.11,900kg	a.2,555tonnes b.4,343 tonnes
No_x		

Remarks: Supports traffic Northeast Asia/Southeast Asia. Potentially problematic as will impact Touth China Sea's traffic arrangements. IATA to review. During SEACG/19 in WP09 Hong Kong China advised they had studied the proposal for track shortening and advised that allowing flights to proceed from M771 DUMOL to ELATO/ENVAR/KAPLI will likely create a bottle neck at these points and result in flights not getting optimum levels or increase ground delay to departures from Hong Kong and Macao to East Asia. However Hong Kong, China would continue to study this proposal.

Potential City Pairs: SEAsia-North Asia Airports

ATS ROUTE NAME: Requested by : Vietnam

ENTRY/EXIT POINT **XXXXX** **ROUTE DESCRIPTION** **Noibai (NOB) .. LAOCAI .. Kunming (KMG)** **FLIGHT LEVEL BAND** **28000 – 46000 feet** **PRIORITY: HIGH/MED/LOW**	**CHART** 

Action Required	States to coordinate imeplementation.
	ICAO to circulate proposal for deletion from BANP.

Benefit		
Cost		
Fuel Saving		
Emission	CO_2	
	NO_X	

Remarks: Because of small traffic demand and cost/benefit considerations, this route is impossible and can not be implemented at present.

ATS ROUTE NAME:

Requested by : Vietnam

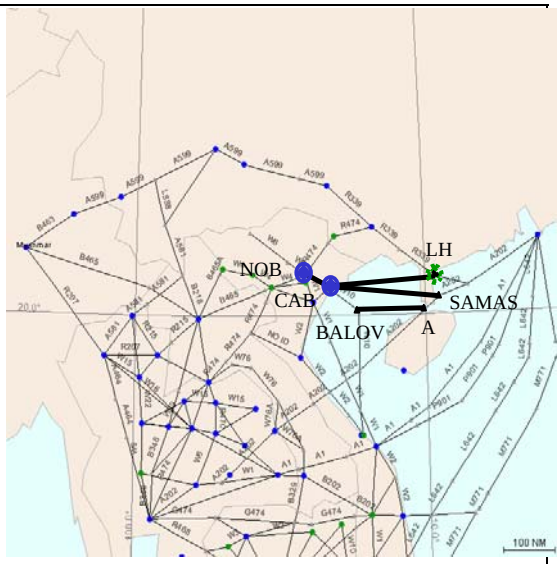
ENTRY/EXIT POINT
XXXXX

ROUTE DESCRIPTION
Three Options:

A) Noibai (NOB) .. Catbi (CAB) .. SAMAS
B) Noibai (NOB) .. Catbi (CAB) .. BALOV .. A .. SAMAS
C) Noibai (NOB) .. Catbi (CAB) .. Huguang (LH)

FLIGHT LEVEL BAND
28000 – 46000 feet

PRIORITY: HIGH/MED/LOW



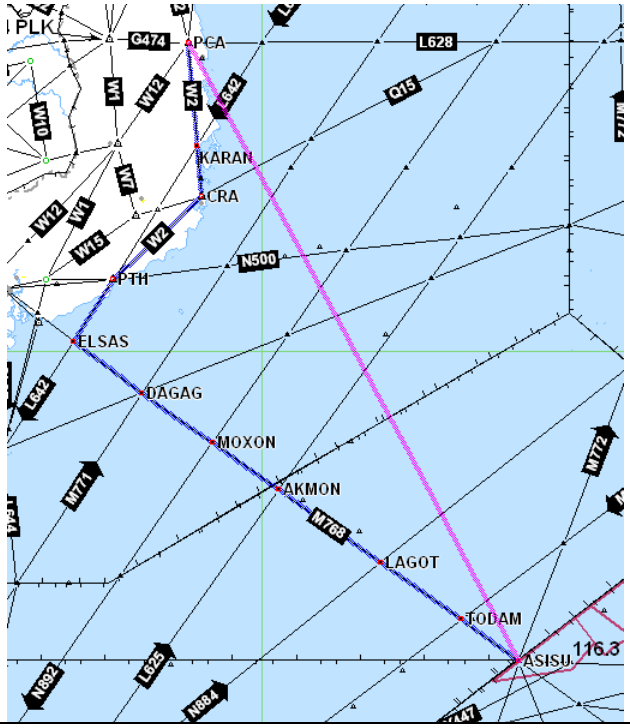
Action Required	States to coordinate to submit proposal for deletion of the requirement.
	ICAO to circulate proposal for deletion from BANP.

Benefit		
Cost		
Fuel Saving		
Emission	CO_2	
	NO_X	

Remarks: Because of small traffic demand and cost/benefit considerations, this route is impossible and can not be implemented at present.

Appendix 3

ATS ROUTE NAME: *SCS 10 (Propose Route designator R321)*		
REQUESTED BY: IATA	Date: 25 June 2012	(ATM/AIS/SAR/SG-22)

ENTRY/EXIT POINT Phu CAT (PCA) - ASISU **ROUTE DESCRIPTION** PCA to ASISU **FLIGHT LEVEL BAND** **PRIORITY:** HIGH (VN commencing SGN-SYD service in October 2012) Plan for 3 flights per week…. Potential for other airlines to use?	**CHART** 

Action Required	IATA
	ICAO

Existing 692.9
New PCA-ASISU = 541.6

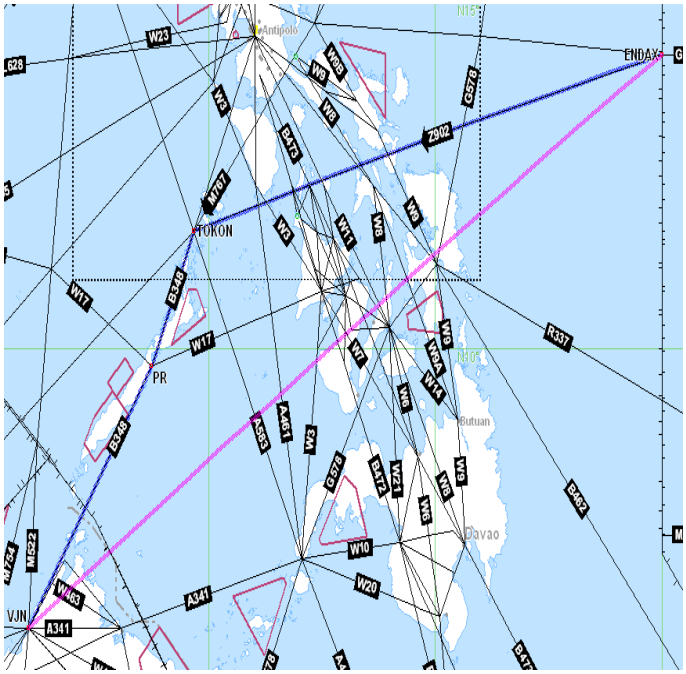
Saving	Per flight	Annual
Mileage / Time	151nm / 22 mins	
Fuel	1827kg	kg
CO_2	5664kg	kg
No_x		

Remarks

Potential City Pairs: SGN-SYD, any others

Appendix 2

ATS ROUTE NAME: *PHI 05 (Propose Route ENDAX-VJN)*		
REQUESTED BY: IATA	Date: 25 June 2012	(ATM/AIS/SAR/SG-22)

ENTRY/EXIT POINT ENDAX-VJN **ROUTE DESCRIPTION** **FLIGHT LEVEL BAND** **PRIORITY:** High/Medium/Low ENDAX-VJN 964.5NM ENDAX-TOKON-PR-VNJ 1033.7NM	**CHART** 

Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time	69.2nm / 8.65 mins	
Fuel	836kg	kg
CO_2	2592kg	kg
No_x		

Remarks

Potential City Pairs:

ATS ROUTE NAME: SEA 5
REQUESTED BY: IATA

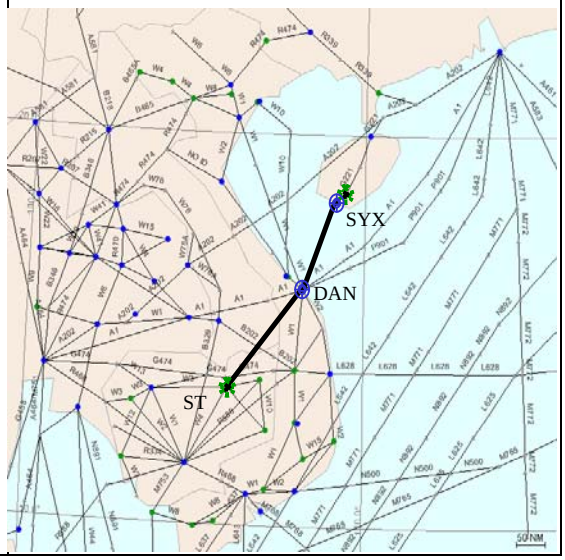
ENTRY/EXIT POINT
STUNG TRENG (ST) – DANANG (DAN)

ROUTE DESCRIPTION
Direct STUNG TRENG (ST) to DANANG (DAN)

FLIGHT LEVEL BAND
29000 – 46000

PRIORITY: HIGH/MED/LOW
MED

CHART



Action Required	IATA
	ICAO

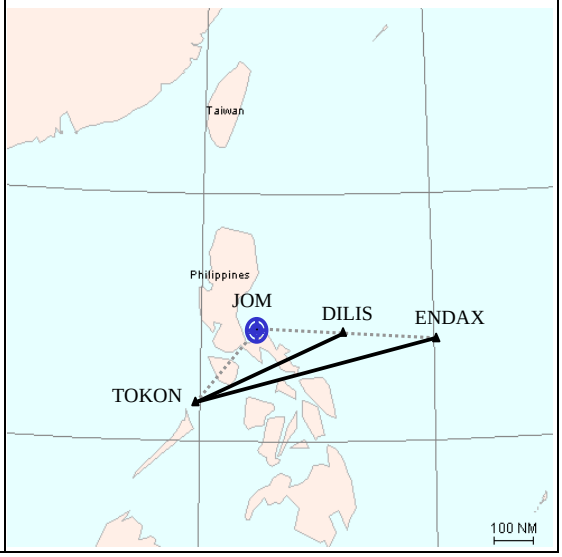
Saving	Per flight	Annual
Mileage / Time	64 nm / 8 min	
Fuel	1040 kg	379,600kg
CO_2	3200 kg	1168 tonnes
No_x		
SO_2		

Remarks: Supports traffic Southeast Asia – Hainan Island. Link with SEA2.

Potential City Pairs: Singapore/ KL –Hainan/Hong Kong

ATS ROUTE NAME: SCS 9

REQUESTED BY: IATA

ENTRY/EXIT POINT	**CHART**
1. ENDAX (FIR Boundary between Oakland and Manila FIRs) or DILIS on G467 **2. TOKON on M767 (Manila FIR)** **ROUTE DESCRIPTION** **ENDAX .. TOKON or** **DILIS .. TOKON** **FLIGHT LEVEL BAND** **28000 – 46000 feet** **PRIORITY: HIGH/MED/LOW (Immediate request with DILIS – TOKON)**	

Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time	a.TOKON-DILIS 45nm/ 5.5in b.TOKON-ENDAX 110nm/14min	
Fuel	a.731kg b. 1788kg	a.266,906kg b.652,440kg
CO_2	a.2250kg b.5,500kg	a.821,250kg b.2,007 tonnes
No_x		

Remarks this route has already been implemented as domestic route Z902, except that it is not a domestic route. It should be a regional route but has not been entered into the BANP and consultation with Oakland is unclear.

Potential City Pairs: SEA –San Francisco/Los Angeles

Chapter 3: East Asia/Russian Federation

(referred to: Russia/East Asian States, CPWG or EATMCG as appropriate for review)

ATS ROUTES	SIGNIFICANT PTS	COORDINATES	FIR	REMARKS
PHI 1	MIA CAB MEVIN	N1430.5 E12101.3 N1528.9 E12101.5 N2100.0 E12233.0	MANILA MANILA MANILA	
PHI 3	TKK MUMOT	N2308.1 E12012.4 N1901.7 E11747.4	TAIPEI MANILA	
PHI 4	HCN AKOTA	N2155.7 E12050.6 N1627.7 E11712.4	TAIPEI MANILA	
TPE 1	APU MIKES	N2510.6 E12131.3 N2935.2 E12544.9	TAIPEI NAHA	
CHA 1 (CHA 5)	YNC GUPAD CGO SB	N3819.4 E 10623.8 N3618.7 E11028.4 N3430.9 E11350.6 N3150.4 E11714.0	LANZHOU LANZHOU WUHAN SHANGHAI	
CHA 2 (CHA 7)	KUQA CHW	N4143.0 E08300.0 N3951.0E09821.0	URUMQI LANZHOU	
CHA 3 (CHA 9A)	FKG OMBON	N4410.0 E08759.0 N3238.5 E10420.0	URUMQI KUNMING	
CHA 4 (CHA 10A)	MORIT NSH POU	N4202.0 E10249.0 N3319.1 E10818.7 N2301.2 E11311.4	LANZHOU LANZHOU GUANGZHOU	
CHA 5 (CHA 11A)	YIN INTIK	N2412.4E11324.6 N4340.8 E11154.1	GUANGZHOU BEIJING	
CHA 6 (CHA14)	OMBON NSH OBLIK SB (LUOGANG)	N3238.5 E10420.0 N3319.1 E10818.7 N3218.0 E11432.0 N3146.8 E11718.1	KUNMING LANZHOU WUHAN SHANGHAI	
CHA 7 (CHA 15)	KANSU KICHA CGQ HLD	N3838.0 E13228.5 N4041.0 E12911.5 N4338.0 E12400.5 N4912.1 E11949.4	PYONGYANG PYONGYANG SHENYANG SHENYANG	
CHA 8 (CHA16)	SCH HTN CHW	N3825.7 E07714.4 N3702.2 E07952.3 N3951.0E09821.0	URUMQI URUMQI LANZHOU	
CHA 9 (CHA17)	YBL SANLI	N3925.7 E10246.3 N3200.0 E100.00.0	LANZHOU KUNMING	

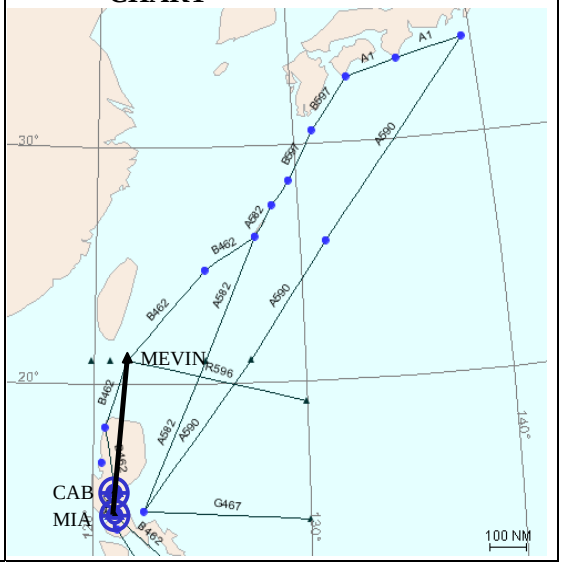
CHA 10 (CHA18)	ARGUK DALIAN HEFEI BEMAG	N4753.0E13439.5 N3857.6 E12130.8 N3146.8 E11718.1 N2601.1 E11400.1	SHENYANG SHENYANG SHANGHAI GUANGZHOU	
CHA 11 (CHA19)	DALIAN XJT	N3857.6 E12130.8 N3557.7 E12014.4	SHENYANG SHANGHAI	
CHA 12	UNWW WXI	N3621.8 E11455.0	SHANGHAI	
IATA2	OMBON RO	N3238.5 E10420.0 N2546.1 E10936.4	KUNMING GUANGZHOU	
IATA3	OMBON SB (LUOGANG)	N3238.5 E10420.0 N3146.8 E11718.1	KUNMING SHANGHAI	
JAP 1	TIC R583 BISIS APITO		FUKUOKA INCHOEN	
CHA13	FENGNING (GM) – DAILAN (DBL)			
FE0008 ex APAC RUS5	SIBIR- new WP- new EKVIK ARLAS- new WP- new EKVIK		KHABAROVSK FUKUOKA	
FE0021 ex APAC RUS4	AVGOK- GTC		KHABAROVSK FUKUOKA	
FE0034 ex APAC RUS9	RITEK- new WP- HLD		KHABAROVSK SHENYANG	
FE0032	TOPAZ- SCH or TOPAZ- HTN		URUMQI TASHKENT	
FE0054	RIVAT- GUMSU		KHABAROVSK PYONGYANG	
FE0055	NULAR- GUMSU		KHABAROVSK PYONGYANG	
FE0022 ex APAC RUS7	DIKUT- SANAR or DIKUT- SAMON		KHABAROVSK PYONGYANG FUKUOKA	
FE0044	Withdrawal R452 KICHA-SESUR-		KHABAROVSK PYONGYANG	

	TERNI			
FE0045	Withdrawal B355 BG-DIKUT-GAMOV-SESUR		KHABAROVSK PYONGYANG	
FE0046	Withdrawal B124 DIKUT-VATIS-TERNI		KHABAROVSK PYONGYANG	
FE0047	Withdrawal G711 AGITA-RIVAT		KHABAROVSK PYONGYANG	
FE0048	Withdrawal G721 VATIS-AGITA-RORIM		KHABAROVSK PYONGYANG	
FE0049	New B356 KICHA- new WP-KN		KHABAROVSK PYONGYANG	
FE0050	New B355 BG-VATIS-TERNI-new WP KICHA		KHABAROVSK PYONGYANG	
FE0051	GUMSU-new WP		KHABAROVSK PYONGYANG	
FE0052	New WP-GUMSU		KHABAROVSK PYONGYANG	
FE0053	New G711 BISUN-TERNI-RIVAT		KHABAROVSK PYONGYANG	
FE0056	RIVAT- new WP-		KHABAROVSK PYONGYANG FUKUOKA	
FE0031 ex APAC RUS11	SIMLI-new WP-BISUN		KHABAROVSK SHENYANG	
FE0030	new WP-AMERA-WZ		KHABAROVSK SHENYANG	
FE0017 ex APAC RUS12	WZ-along G494-SIMLI		KHABAROVSK SHENYANG	
FE0029 ex APAC RUS13	SIMLI-new WP-UGABI		KHABAROVSK SHENYANG	
FE0035 ex APAC RUS15	UGABI-new WP-AMERA-WZ		KHABAROVSK SHENYANG	
FE0041 Ex APAC RUS6	NALEB-SIMLI-HEK-new WP-BISUN-SANAR-ARLAS-new WP-new EKVIK		KHABAROVSK SHENYANG FUKUOKA	

	(eastbound) new EKVIK-new WP-ARLAS-SANAR-BISUN-new WP-AMERA-WZ-NALEB (westbound)			

ATS ROUTE NAME: PHI 1

REQUESTED BY: IATA

ENTRY/EXIT POINT **ROUTE DESCRIPTION** **Manila (MIA) .. MEVIN or** **Cabanatuan (CAB) .. MEVIN** **FLIGHT LEVEL BAND** **28000 – 46000 feet** **PRIORITY: HIGH/MED/LOW**	**CHART** 

Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time	11nm/1.5min	
Fuel	179kg	59,300kg
CO_2	550kg	200,750kg
No_x		

Remarks: Supports traffic between Manila and Japan/North America.

Potential City Pairs: Philippines-Japan/North America

ATS ROUTE NAME: PHI 3

REQUESTED BY: IATA

ENTRY/EXIT POINT
XXXXX

ROUTE DESCRIPTION
Shikang (TNN) … XXXXX … MUMOT

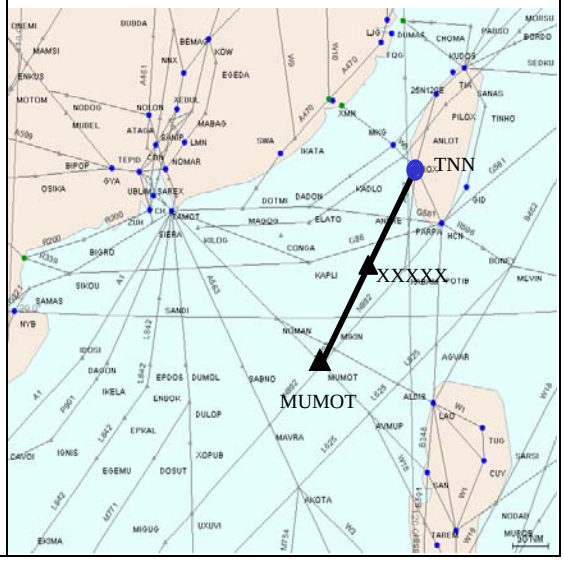
FLIGHT LEVEL BAND

29000 - 46000

PRIORITY: HIGH/MED/LOW

HIGH

CHART



Action Required	IATA
	ICAO

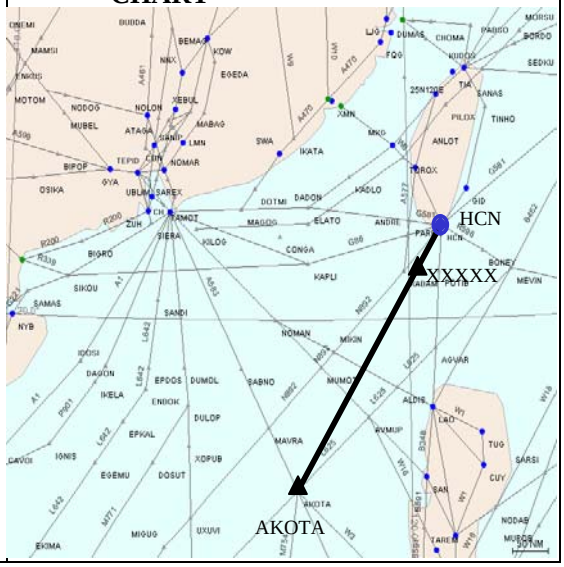
Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: Supports traffic from TNN to Southeast Asia

Potential City Pairs:

ATS ROUTE NAME: PHI 4

REQUESTED BY: IATA

ENTRY/EXIT POINT **XXXXX** **ROUTE DESCRIPTION** **AKOTA… XXXXX … Hengchun (HCN)** **FLIGHT LEVEL BAND** **29000 - 46000** **PRIORITY: HIGH/MED/LOW** **HIGH**	**CHART** 

Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: Supports traffic from Southeast Asia to HCN

Potential City Pairs:

ATS ROUTE NAME: TPE 1

REQUESTED BY: IATA

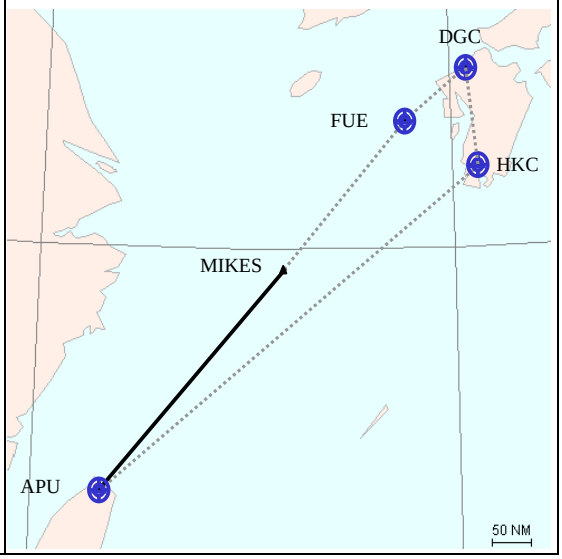
ENTRY/EXIT POINT
APU / XXXXX / MIKES

ROUTE DESCRIPTION
APU- MIKES

FLIGHT LEVEL BAND
28000 – 46000 feet

PRIORITY: HIGH/MED/LOW

CHART



Action Required	IATA
	ICAO

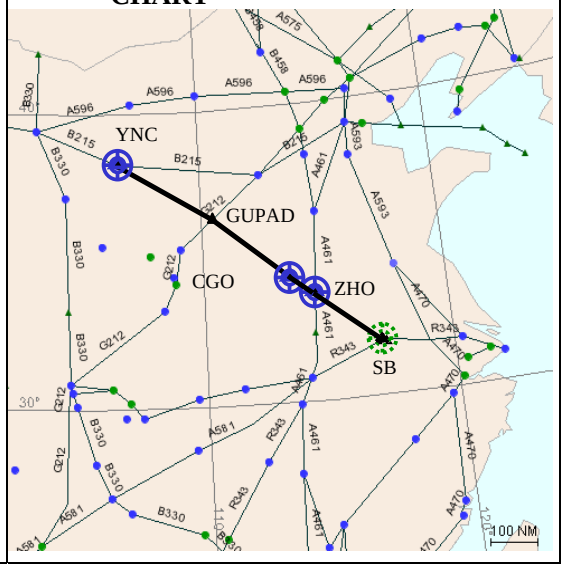
Saving	Per flight	Annual
Mileage / Time	40nm/ 5min	
Fuel	650kg	237,000kg
CO_2	2,000kg	730,000kg
No_x		

Remarks: Supports traffic between APU and Japan.

Potential City Pairs: SEA/HKG/TPE-Fukuoka

ATS ROUTE NAME: CHA 1 (Renumbered from CHA5)

REQUESTED BY: IATA

ENTRY/EXIT POINT **ROUTE DESCRIPTION** **Yinchuan (YNC) .. GUPAD .. Zhengzhou (CGO) .. Zhoukou (ZHO) .. Luogang (SB)** **FLIGHT LEVEL BAND** **8400 – 15000 meters** **PRIORITY: HIGH/MED/LOW**	**CHART** 

Action Required	IATA
	ICAO

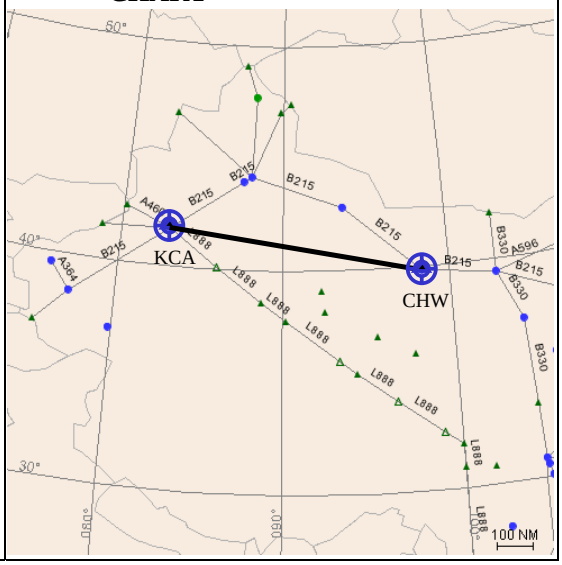
Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks

Potential City Pairs: Europe-Shanghai

ATS ROUTE NAME: CHA2 (Renumbered from CHA 7)

REQUESTED BY: IATA

ENTRY/EXIT POINT **ROUTE DESCRIPTION** **Kuqa (KCA) .. Jiayuguan (CHW)** **FLIGHT LEVEL BAND** **8400 – 15000 meters** **PRIORITY: HIGH/MED/LOW**	**CHART** 

Action Required	IATA
	ICAO

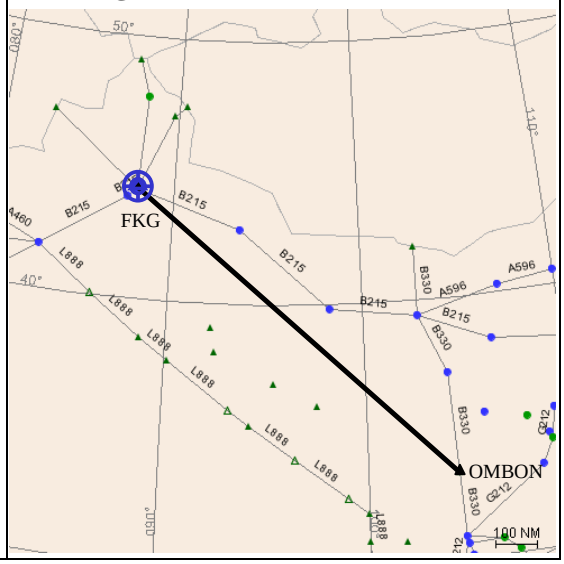
Saving	Per flight	Annual
Mileage / Time	93nm/ 12min	
Fuel		
CO_2		
No_x		

Remarks: There are exiting routes between KCA and CHW. Direct route is impossible.

Potential City Pairs: Middle East/Pakistan-China/Korea/Japan

ATS ROUTE NAME: CHA 3 (Renumbered from CHA 9A)

REQUESTED BY: IATA

ENTRY/EXIT POINT ROUTE DESCRIPTION **Fukang (FKG) .. OMBON** FLIGHT LEVEL BAND **8400 – 15000 meters** PRIORITY: HIGH/MED/LOW	CHART 

Action Required	IATA
	ICAO

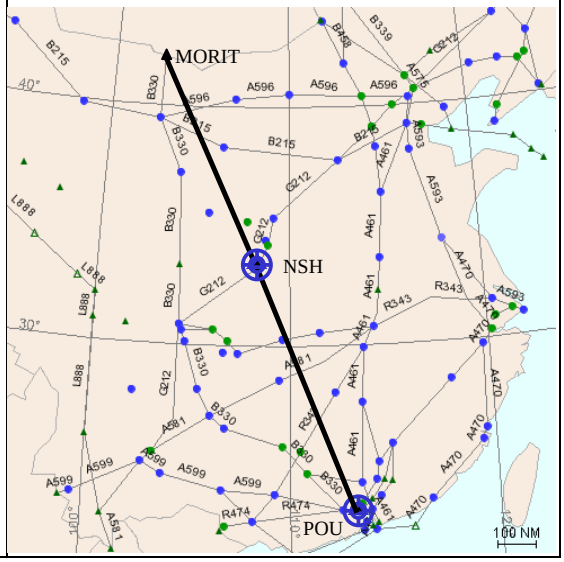
Saving	Per flight	Annual
Mileage / Time	123nm/ 15.5min	
Fuel	2000kg	730,000kg
CO_2	6,150kg	2,245 tonnes
No_x		

Remarks: This direct route is impossible and can not be implemented at present.

Potential City Pairs: Europe/Russia-Pearl River Delta Airports

ATS ROUTE NAME: CHA4 (Renumbered from CHA 10A)

REQUESTED BY: IATA

ENTRY/EXIT POINT	CHART
ROUTE DESCRIPTION **MORIT .. Ningshan (NSH) .. Pingzhou (POU)** **FLIGHT LEVEL BAND** **8400 – 15000 meters** **PRIORITY: HIGH/MED/LOW**	

Action Required	IATA
	ICAO

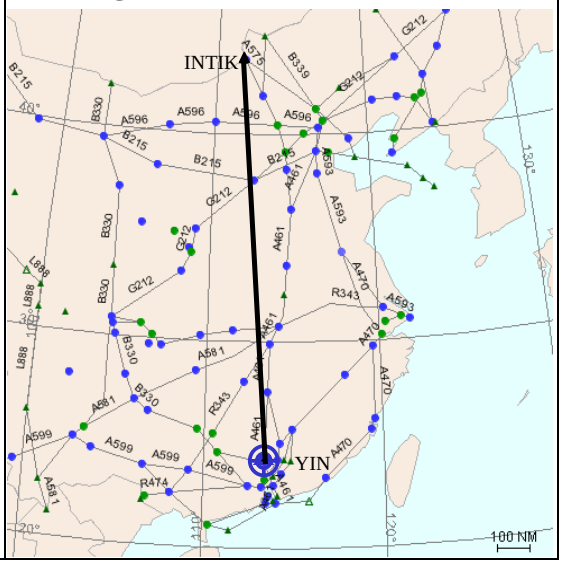
Saving	Per flight	Annual
Mileage / Time	152nm/ 19min	
Fuel	2470kg	901,000kg
CO_2	7,600kg	2,774 tonnes
No_x		

Remarks: This direct route is impossible and can not be implemented.

Potential City Pairs: Europe Russia-Pearl River Delta Airports

ATS ROUTE NAME: CHA 5 (Renumbered from CHA 11A)

REQUESTED BY: IATA

ENTRY/EXIT POINT ROUTE DESCRIPTION Yingde (YIN) .. INTIK FLIGHT LEVEL BAND 8400 – 15000 meters PRIORITY: HIGH/MED/LOW	CHART 

Action Required	IATA
	ICAO

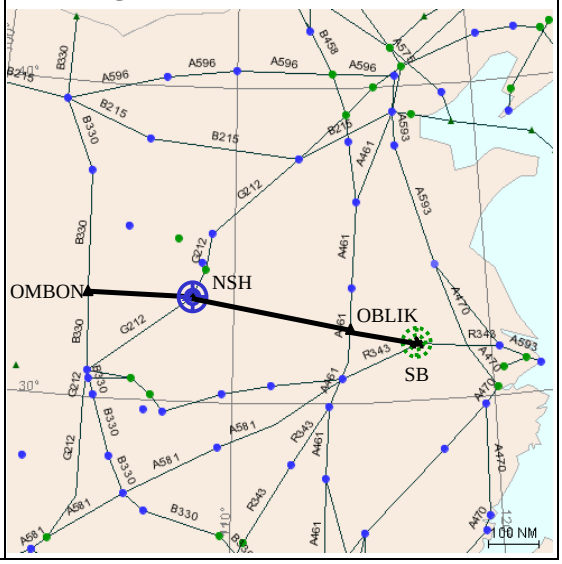
Saving	Per flight	Annual
Mileage / Time	140nm/17.5min	
Fuel	2275kg	830,000kg
CO_2	7,000kg	2,555 tonnes
No_x		

Remarks: This direct route is impossible and can not be implemented.

Potential City Pairs: Europe/Russia –Pearl River Delta Airports

ATS ROUTE NAME: CHA 6 (Renumbered from CHA 14)

REQUESTED BY: IATA

ENTRY/EXIT POINT ROUTE DESCRIPTION **OMBON .. Ningshan (NSH) .. OBLIK .. Luogang (SB)** FLIGHT LEVEL BAND **8400 – 15000 meters** **PRIORITY: HIGH/MED/LOW**	CHART 

Action Required	IATA
	ICAO

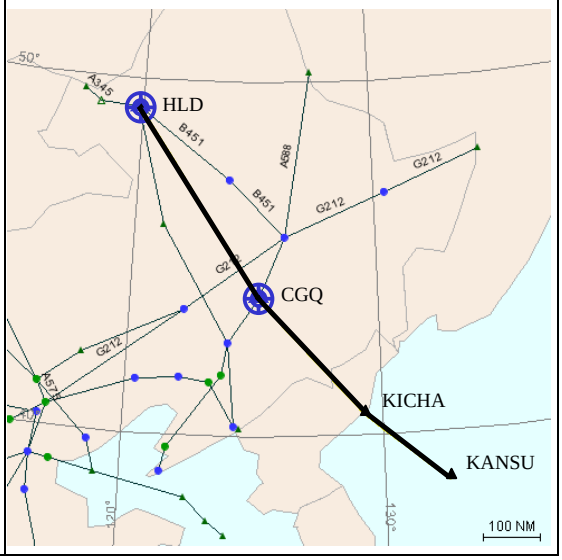
Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: This route is impossible and can not be implemented at present.

Potential City Pairs: Europe-Shanghai

ATS ROUTE NAME: CHA 7 (Renumbered from CHA 15)

REQUESTED BY:IATA

ENTRY/EXIT POINT **KANSU/XXXXX** **ROUTE DESCRIPTION** **KANSU .. KICHA .. Changchun (CGQ) .. Hailar (HLD)** **FLIGHT LEVEL BAND** **8400 – 15000 meters** **PRIORITY: HIGH/MED/LOW**	**CHART** 

Action Required	IATA
	ICAO

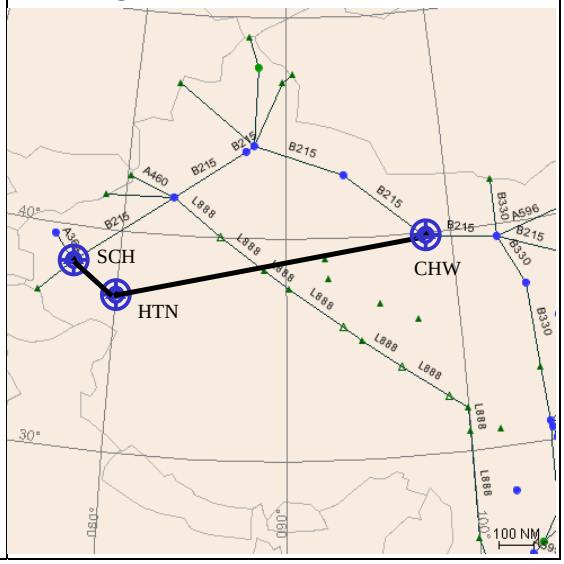
Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks

Potential City Pairs: Europe-Korea /Japan

ATS ROUTE NAME: CHA 8 (Renumbered from CHA 16)

REQUESTED BY: IATA

ENTRY/EXIT POINT **ROUTE DESCRIPTION** **Shache (SCH) .. Hotan (HTN) .. Jiayuguan (CHW)** **FLIGHT LEVEL BAND** **8400 – 15000 meters** **PRIORITY: HIGH/MED/LOW**	**CHART** 

Action Required	IATA
	ICAO

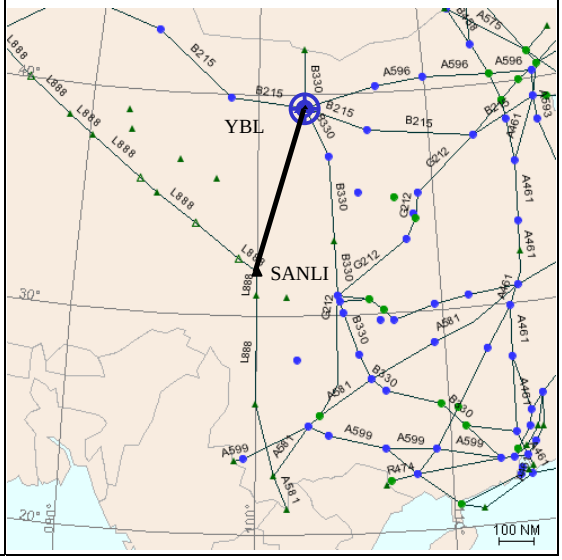
Saving	Per flight	Annual
Mileage / Time	69nm/9min	
Fuel	1121kg	409,000kg
CO_2	3,450 kg	1,260 tonnes
No_x		

Remarks: Direct route between HTN and CHW is impossible and can not be implemented at present.

Potential City Pairs: Middle East /Pakistan-China/Korea/Japan

ATS ROUTE NAME: CHA 9 (Renumbered from CHA 17)

REQUESTED BY: IATA

ENTRY/EXIT POINT **ROUTE DESCRIPTION** **Yabrai (YBL) .. SANLI** **FLIGHT LEVEL BAND** **8400 – 15000 meters** **PRIORITY: HIGH/MED/LOW**	**CHART** 

Action Required	IATA.
	ICAO

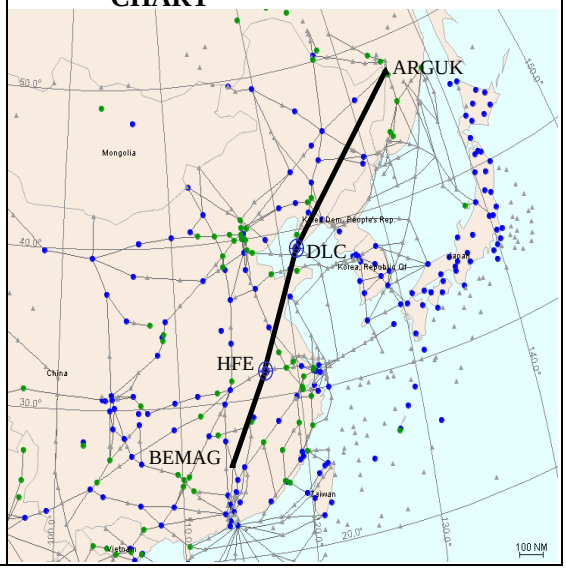
Saving	Per flight	Annual
Mileage / Time	48nm/ 6min	
Fuel	780kg	284,000kg
CO_2	2,400kg	876,000kg
No_x		

Remarks: This direct route is impossible and can not be implemented at present.

Potential City Pairs: North America-SE Asia

ATS ROUTE NAME: CHA 10 (Renumbered from CHA18-formerly SE1 in CTF/2000)

REQUESTED BY: IATA

ENTRY/EXIT POINT	**CHART**
ARGUK/BEMAG **ROUTE DESCRIPTION** ARGUK/DALIAN/HEFEI/BEMAG **FLIGHT LEVEL BAND** 8400-15000 metres **PRIORITY: HIGH/MED/LOW** HIGH	

Action Required	IATA
	ICAO

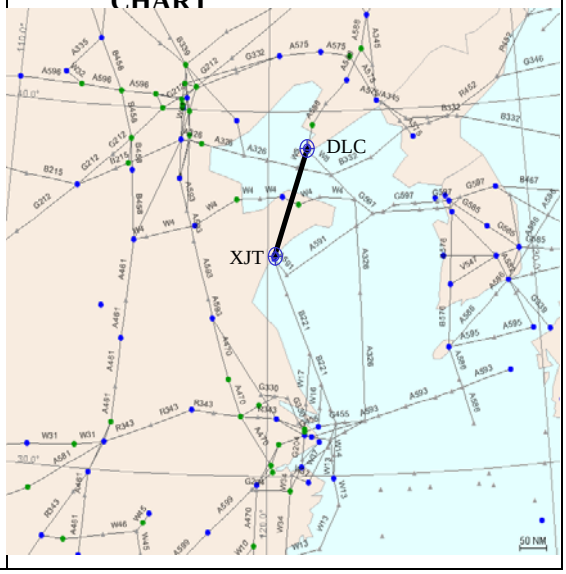
Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: There are exiting routes between ARGUK-DLC-HFE-BEMAG. Direct route between ARGUK-DLC-HFE-BEMAG is impossible.

Potential City Pairs: North America- Pearl River Delta

ATS ROUTE NAME: CHA 11 (Renumbered from CHA19 formerly SE2 in CTF/2000)

REQUESTRED BY:IATA

ENTRY/EXIT POINT	**CHART**
DALIAN/(DLC) to XJT/B221 **ROUTE DESCRIPTION** DALIAN/ XJT /B221 **FLIGHT LEVEL BAND** 8400-15000 metres **PRIORITY: HIGH/MED/LOW** HIGH	

Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: There are exiting routes between DLC and XJT. Direct route is impossible.

Potential City Pairs: North America-Shanghai

ATS ROUTE NAME: CHA 12

Requested by : IATA

ENTRY/EXIT POINT

UNWW to WXI

ROUTE DESCRIPTION

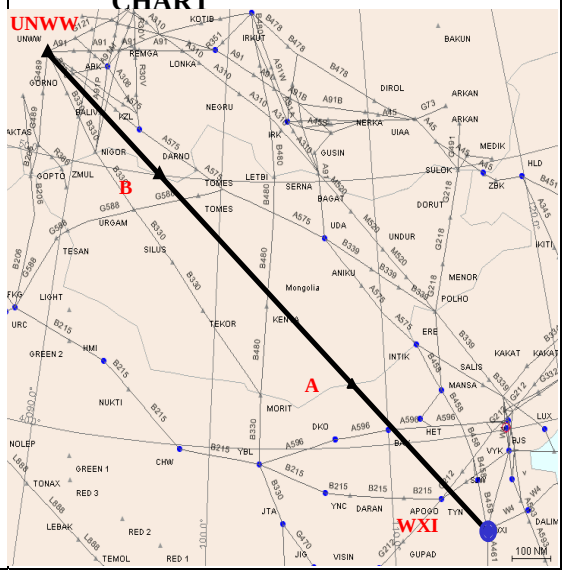
Weixian (WXI) .. A (ZBPE/ZMUB) .. B (ZMUB/UNKY) .. Novokuznetsk (UNWW)
Uni-directional

FLIGHT LEVEL BAND

28000 – 46000 feet

PRIORITY: HIGH/MED/LOW

CHART



Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time	166nm/20min	
Fuel	2620kg	956,000kg
CO_2	8070kg	2,944 tonnes
No_x		

Remarks: This would allow following city pair flights to avoid the congested airspace around the Beijing Capital Airport.

Potential City Pairs: Pearl River Delta – Europe and Shanghai – Europe.

ATS ROUTE NAME: IATA 2

REQUESTED BY: IATA

ENTRY/EXIT POINT **ROUTE DESCRIPTION** **FLIGHT LEVEL BAND** **8400 – 15000 meters** **PRIORITY: HIGH/MED/LOW**	**CHART** 

Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: There are exiting routes between OMBON and RO. Direct route is impossible at present.

Potential City Pairs: Europe –Pearl River Delta Airports

ATS ROUTE NAME: IATA 3 REQUESTED BY: IATA

ENTRY/EXIT POINT **ROUTE DESCRIPTION** **FLIGHT LEVEL BAND** **8400 – 15000 meters** **PRIORITY: HIGH/MED/LOW**	**CHART** 

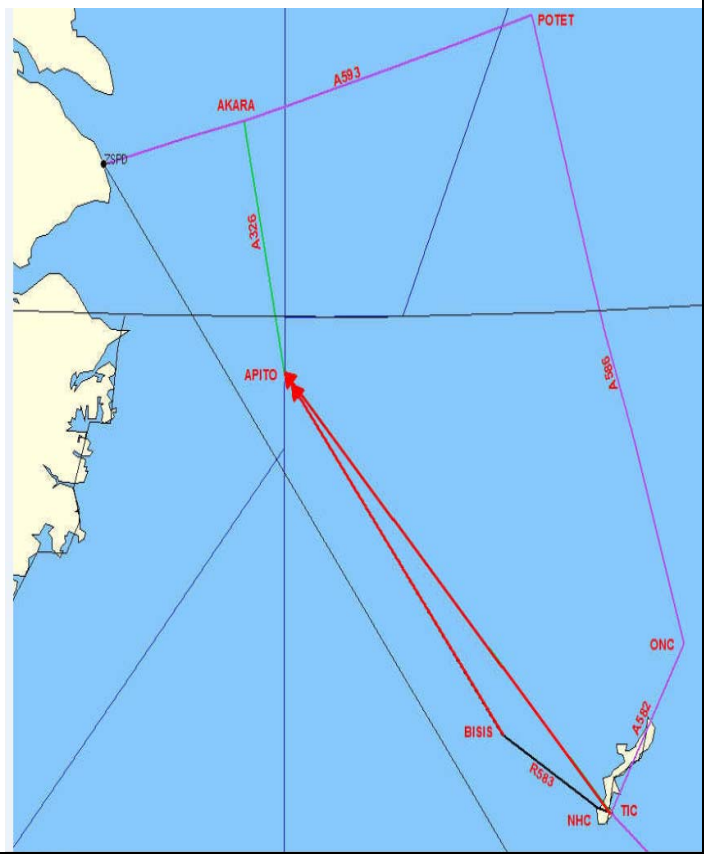
Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: There are exiting routes between OMBON and SB; direct route is impossible at present.

Potential City Pairs: Europe-Shanghai

ATS ROUTE NAME: *JAP 1*		
REQUESTED BY: IATA	Date: 25 June 2012	(ATM/AIS/SAR/SG-22)

ENTRY/EXIT POINT TIC - APITO **ROUTE DESCRIPTION** PIC - APITO **Alternative:** TIC – R583- BISIS – APITO **FLIGHT LEVEL BAND** **PRIORITY:**	**CHART** 

Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time	19 mins/19 mins	
Fuel	3094kg/3021kg	kg
CO_2	9591kg/9365	kg
No_x		

ATS ROUTE NAME: FE0008 / RDGE 15.003 / APAC RUS 5 Requested by : IATA / RUS

ENTRY/EXIT POINT **ROUTE DESCRIPTION** Implementation of 2 bi-directional ATS routes: **a. SIBIR –** **new waypoint on border Khabarovsk FIR/Fukuoka FIR –** **(new EKVIK waypoint)** **b. ARLAS –** **new waypoint on border Khabarovsk FIR/Fukuoka FIR –** **(new EKVIK waypoint)** **FLIGHT LEVEL BAND** **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE**	**CHART**

Action Required	IATA
	ICAO Coordination Russian Federation, Japan

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: improve north-south traffic flows between Khabarovsk FIR and Fukuoka FIR, Original SIBIR – LURED – EKVIK proposal will be changed due to new position of EKVIK further east as a result of the planned airspace structure change in Japan, when both new ATS routes will be implemented the existing B451 ARLAS-NATEK-LURED-IGROD will be withdrawn

Potential City Pairs:

ATS ROUTE NAME: FE0021 / RDGE 13.028 / APAC RUS 4 Requested by : IATA / RUS

ENTRY/EXIT POINT **ROUTE DESCRIPTION** Implementation of bi-directional ATS route segment: **AVGOK –** **GTC** **FLIGHT LEVEL BAND** **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE**	**CHART**

Action Required	IATA
	ICAO Coordination Russian Federation, Japan

Saving	Per flight	Annual
Mileage / Time	13 NM	
Fuel		
CO_2		
No_x		

Remarks: During a bi-lateral meeting between the State ATM Corporation and the JCAB Japan (in Tokyo, November 2012) a difference in coordinates of the AVGOK waypoint was identified in the aeronautical information publications of Russia and Japan. The incorrect coordinates were confirmed by Japan and a decision was made to report this issue to the appropriate Regional ICAO Offices. The Russian Federation proposes the following coordinates (4336N and 13815E) for the AVGOK waypoint

Potential City Pairs:

ATS ROUTE NAME: FE0034 / RDGE 16.027 / APAC RUS 9 Requested by : IATA / RUS

ENTRY/EXIT POINT **ROUTE DESCRIPTION** Implementation of new bi-directional ATS route: **RITEK –** **new waypoint 495025N 1182854E –** **HLD** **FLIGHT LEVEL BAND** **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE**	**CHART**

Action Required	IATA
	ICAO Coordination Russian Federation, China

Saving	Per flight	Annual
Mileage / Time	159 NM	
Fuel		
CO_2		
No_x		

Remarks:

Potential City Pairs:

ATS ROUTE NAME: FE0032 / RDGE 17.005 Requested by : IATA / TJK

ENTRY/EXIT POINT **ROUTE DESCRIPTION** Implementation of new bi-directional ATS route segment: **TOPAZ –** **SCH (Sache)** or **TOPAZ –** **HTN (Hotan)** **FLIGHT LEVEL BAND** **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE**	**CHART**

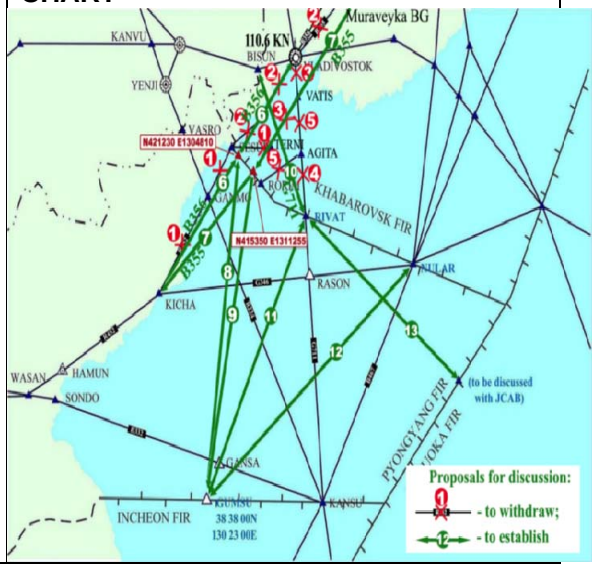
Action Required	IATA
	ICAO Coordination China, Tajikistan

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: further improve ATS route network in the interface between China and Tajikistan

Potential City Pairs:

ATS ROUTE NAME: FE0054 / RDGE 20.015 Requested by : PRK / RUS

ENTRY/EXIT POINT **ROUTE DESCRIPTION** Implementation of bi-directional ATS route **RIVAT (N412900 E1321600) –** **GUMSU (N383800 E1302300)** **FLIGHT LEVEL BAND** 21000 – 53000 feet **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE** 11 December 2014	**CHART** 

Action Required	IATA
	ICAO

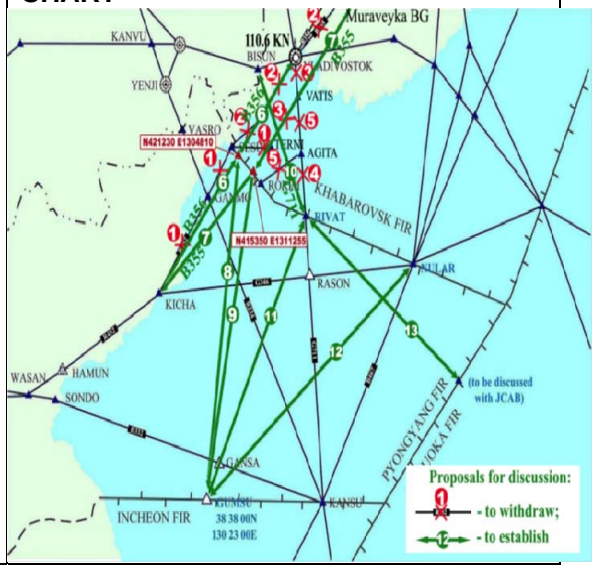
Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: Khabarovsk/Vladivostok airspace re-organisation project, (in map No. 11)

Potential City Pairs:

ATS ROUTE NAME: FE0055 / RDGE 20.016

Requested by : PRK / RUS

ENTRY/EXIT POINT	**CHART**
ROUTE DESCRIPTION Implementation of bi-directional ATS route **NULAR (N405912 E1341100) – GUMSU (N383800 E1302300)** **FLIGHT LEVEL BAND** 28000 – 53000 feet **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE** 11 December 2014	

Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: Khabarovsk/Vladivostok airspace re-organisation project, (in map No. 12)

Potential City Pairs:

ATS ROUTE NAME: FE0022 / RDGE 13.033 / APAC RUS7 Requested by : RUS / IATA

ENTRY/EXIT POINT **ROUTE DESCRIPTION** Implementation of bi-directional ATS route **DIKUT –** **SANAR** or **DIKUT –** **SAMON** **FLIGHT LEVEL BAND** **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE**	**CHART**

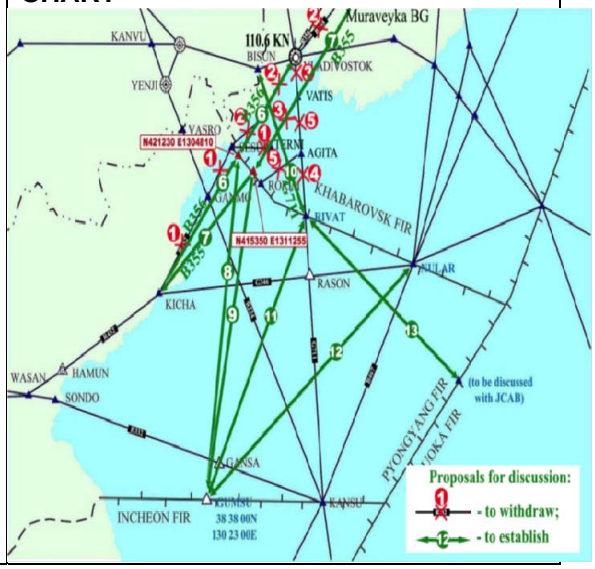
Action Required	IATA
	ICAO Coordination DPRK, Japan, Russian Federation

Saving	Per flight	Annual
Mileage / Time	160 NM	
Fuel		
CO_2		
No_x		

Remarks: revised proposal for bi-directional route from BISUN – TERNI – RIVAT in combination with the Vladivostok/Khabarovsk airspace structure changes

Potential City Pairs:

ATS ROUTE NAME: FE0044 / RDGE 20.005 Requested by : PRK / RUS

ENTRY/EXIT POINT	**CHART**
ROUTE DESCRIPTION Withdrawal of the ATS route segment **R452:** **KICHA (N404103 E1291132) –** **SESUR (N421730 E1304130) –** **TERNI (N422213 E1314003)** **FLIGHT LEVEL BAND** **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE** As part of project in 2015	

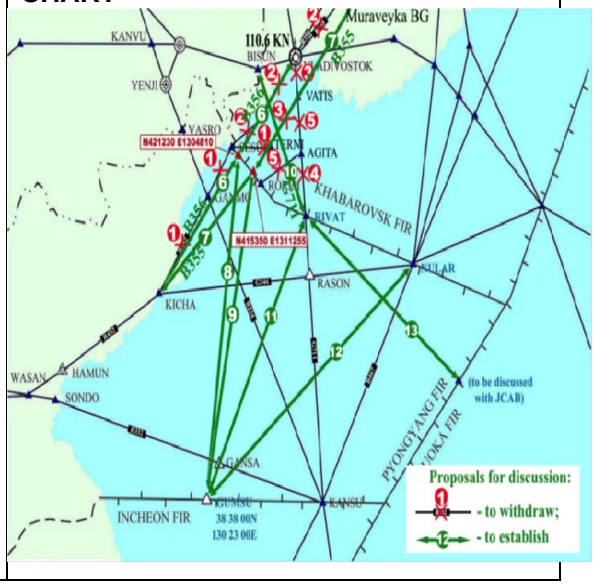
Action Required	IATA
	ICAO Coordination DPRK, Russian Federation

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: Khabarovsk/Vladivostok airspace re-organisation project, (in map No. 1)

Potential City Pairs:

ATS ROUTE NAME: FE0045 / RDGE 20.006 Requested by : PRK / RUS

ENTRY/EXIT POINT	**CHART**
ROUTE DESCRIPTION Withdrawal of the ATS route segment **B355:** **Muraveyka (BG) (N435303 E1331511) – DIKUT (N432355 E1320851) – GAMOV (N423301 E1311303) – SESUR (N421730 E1304130)** **FLIGHT LEVEL BAND** **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE** As part of project in 2015	

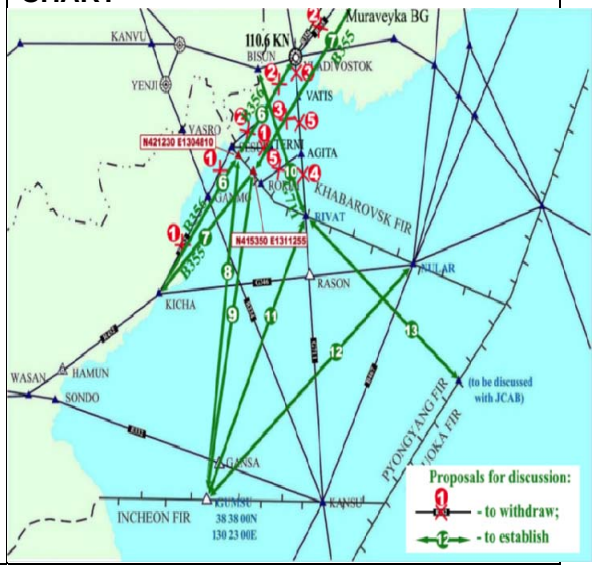
Action Required	IATA
	ICAO Coordination DPRK, Russian Federation

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: Khabarovsk/Vladivostok airspace re-organisation project, (in map No. 2)

Potential City Pairs:

ATS ROUTE NAME: FE0046 / RDGE 20.007 Requested by : PRK / RUS

ENTRY/EXIT POINT	**CHART**
ROUTE DESCRIPTION Withdrawal of the ATS route segment **B124:** **DIKUT (N432355 E1320851) –** **VATIS (N425143 E1320851) –** **TERNI (N422213 E1314003)** **FLIGHT LEVEL BAND** **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE** As part of project in 2015	

Action Required	IATA
	ICAO Coordination DPRK, Russian Federation

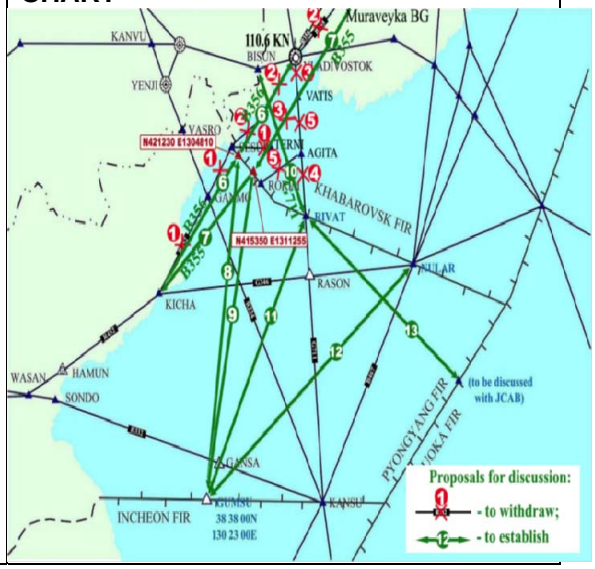
Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: Khabarovsk/Vladivostok airspace re-organisation project, (in map No. 3)

Potential City Pairs:

ATS ROUTE NAME: FE0047 / RDGE 20.008

Requested by : PRK / RUS

ENTRY/EXIT POINT	**CHART**
ROUTE DESCRIPTION Withdrawal of the ATS route segment **G711:** **AGITA (N421937 E1321151) –** **RIVAT (N412900 E1321600)** **FLIGHT LEVEL BAND** **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE** As part of project in 2015	

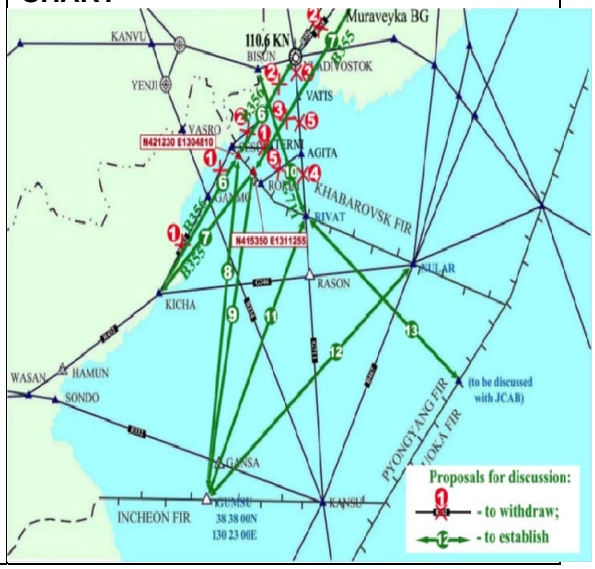
Action Required	IATA
	ICAO Coordination DPRK, Russian Federation

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: Khabarovsk/Vladivostok airspace re-organisation project, (in map No. 4)

Potential City Pairs:

ATS ROUTE NAME: FE0048 / RDGE 20.009 Requested by : PRK / RUS

ENTRY/EXIT POINT	**CHART**
ROUTE DESCRIPTION Withdrawal of the ATS route segment **G721:** **VATIS (N425143 E1320851) –** **AGITA (N421937 E1321151) –** **RORIM (N415031 E1311639)** **FLIGHT LEVEL BAND** **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE** As part of project in 2015	

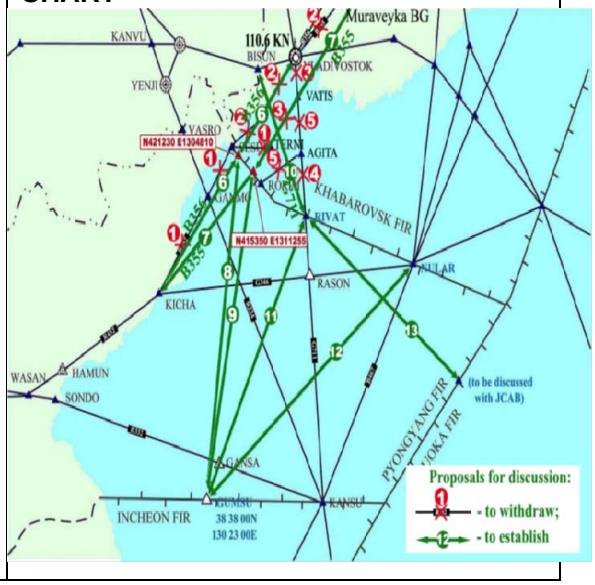
Action Required	IATA
	ICAO Coordination DPRK, Russian Federation

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: Khabarovsk/Vladivostok airspace re-organisation project, (in map No. 5)

Potential City Pairs:

ATS ROUTE NAME: FE0049 / RDGE 20.010 Requested by : PRK / RUS

ENTRY/EXIT POINT	**CHART**
ROUTE DESCRIPTION Implementation of uni-directional eastbound ATS route segment **B356**: **KICHA (N404103 E1291140) – new waypoint (N421230 E1304810) – 110.6 KN Vladivostok (N432303 E1320708)** **FLIGHT LEVEL BAND** 17000 – 53000 feet **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE** As part of project in 2015	

Action Required	IATA
	ICAO Coordination DPRK, Russian Federation

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: Khabarovsk/Vladivostok airspace re-organisation project, (in map No. 6)

Potential City Pairs:

ATS ROUTE NAME: FE0050 / RDGE 20.011

Requested by : PRK / RUS

ENTRY/EXIT POINT

ROUTE DESCRIPTION

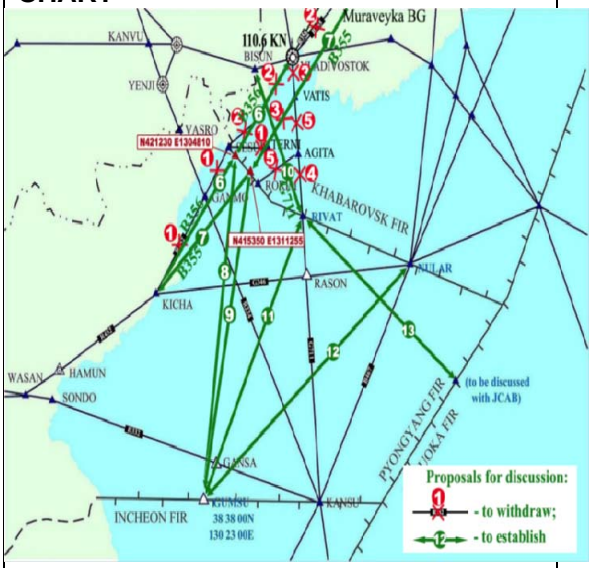
Implementation of uni-directional westbound ATS route segment **B355**:
Muraveyka (BG) (N435303 E1331511) – VATIS (N425143 E1320851) – TERNI (N422213 E1314003) – new waypoint (N415350 E1311255) – KICHA (N404106 E1291140)

FLIGHT LEVEL BAND
18000 – 51000 feet

PRIORITY: HIGH/MED/LOW

PLANNED IMPLEMENTATION DATE
As part of project in 2015

CHART



Action Required	IATA
	ICAO Coordination DPRK, Russian Federation

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: Khabarovsk/Vladivostok airspace re-organisation project, (in map No. 7)

Potential City Pairs:

ATS ROUTE NAME: FE0051 / RDGE 20.012

Requested by : PRK / RUS

ENTRY/EXIT POINT

ROUTE DESCRIPTION

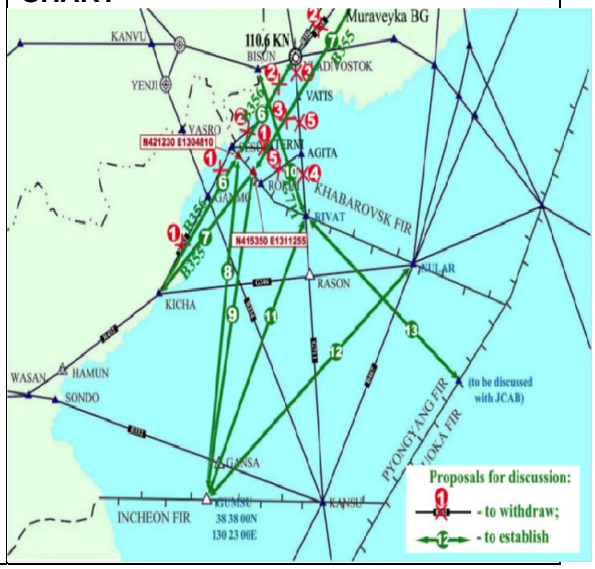
Implementation of new uni-directional eastbound ATS route segment:
GUMSU (N383800 E1302300) – new waypoint (N421230 E1304810)

FLIGHT LEVEL BAND
29000 – 53000 feet

PRIORITY: HIGH/MED/LOW

PLANNED IMPLEMENTATION DATE
As part of project in 2015

CHART



Action Required	IATA
	ICAO Coordination DPRK, Russian Federation

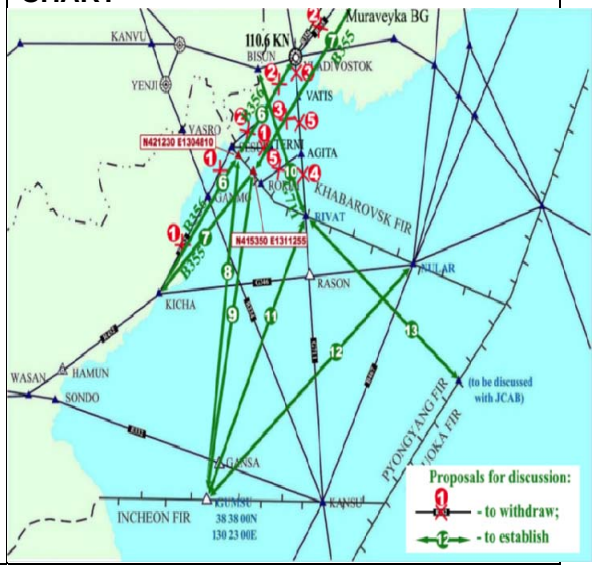
Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: Khabarovsk/Vladivostok airspace re-organisation project, (in map No. 8)

Potential City Pairs:

ATS ROUTE NAME: FE0052 / RDGE 20.013

Requested by : PRK / RUS

ENTRY/EXIT POINT	**CHART**
ROUTE DESCRIPTION Implementation of new uni-directional westbound ATS route segment: **new waypoint (N415350 E1311255) – GUMSU (N383800 E1302300)** **FLIGHT LEVEL BAND** 28000 – 51000 feet **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE** As part of project in 2015	

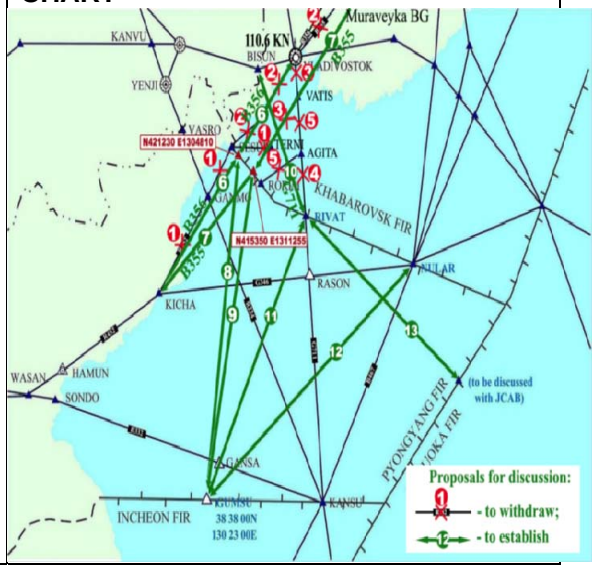
Action Required	IATA
	ICAO Coordination DPRK, Russian Federation

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: Khabarovsk/Vladivostok airspace re-organisation project, (in map No. 9)

Potential City Pairs:

ATS ROUTE NAME: FE0053 / RDGE 20.014 Requested by : PRK / RUS

ENTRY/EXIT POINT	**CHART**
ROUTE DESCRIPTION Implementation of bi-directional ATS route segment **G711:** **BISUN (N431400 E1311148) –** **TERNI (N422213 E1314003) –** **RIVAT (N412900 E1321600)** **FLIGHT LEVEL BAND** 21000 – 53000 feet **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE** As part of project in 2015	

Action Required	IATA
	ICAO Coordination DPRK, Russian Federation

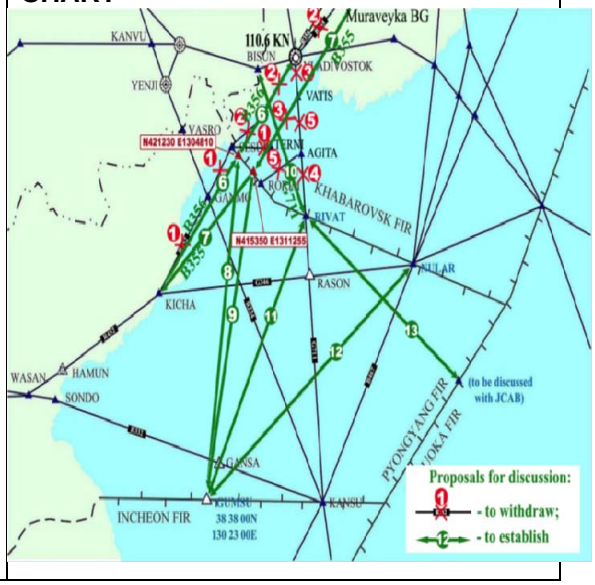
Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: Khabarovsk/Vladivostok airspace re-organisation project, (in map No. 10)

Potential City Pairs:

ATS ROUTE NAME: FE0056 / RDGE 20.017

Requested by : PRK / RUS

ENTRY/EXIT POINT	**CHART**
ROUTE DESCRIPTION Implementation of new bi-directional ATS route segment: **RIVAT (N412900 E1321600) –** **to new waypoint on FIR border (NXXXXXX EXXXXXXX) between Pyongyang FIR and Fukuoka FIR** **FLIGHT LEVEL BAND** **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE** As part of project in 2015	

Action Required	IATA
	ICAO Coordination DPRK, Japan, Russian Federation

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: Khabarovsk/Vladivostok airspace re-organisation project, (in map No. 13), for further discussion with JCAB, Japan

Potential City Pairs:

ATS ROUTE NAME: FE0031 / RDGE 16.005 / APAC RUS11 Requested by : IATA / RUS

ENTRY/EXIT POINT **ROUTE DESCRIPTION** Implementation of new uni-directional eastbound ATS route: **SIMLI –** **new waypoint 4920N 12706E –** **BISUN** **FLIGHT LEVEL BAND** **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE**	**CHART** 

Action Required	IATA
	ICAO Coordination Russian Federation, China

Saving	Per flight	Annual
Mileage / Time	150 NM	
Fuel		
CO_2		
No_x		

Remarks: SIMLI dualisation/reorganisation project

Potential City Pairs:

ATS ROUTE NAME: FE0030 / RDGE 18.020

Requested by : IATA / RUS

ENTRY/EXIT POINT

ROUTE DESCRIPTION

Implementation of new bi-directional ATS route segment:
new waypoint 493236N 1281936E –
AMERA –
WZ (Srednebeloye)

FLIGHT LEVEL BAND

PRIORITY: HIGH/MED/LOW

PLANNED IMPLEMENTATION DATE

CHART

Action Required	IATA
	ICAO Coordination Russian Federation, China

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: SIMLI dualisation/reorganisation project

Potential City Pairs:

ATS ROUTE NAME: FE0017 / RDGE 15.035 / APAC RUS12

Requested by : IATA / RUS

ENTRY/EXIT POINT

ROUTE DESCRIPTION

Implementation of new uni-directional westbound ATS route segment:
WZ (Srednebeloye) –
along G494 –
SIMLI

FLIGHT LEVEL BAND

PRIORITY: HIGH/MED/LOW

PLANNED IMPLEMENTATION DATE

CHART

Action Required	IATA
	ICAO Coordination Russian Federation, China

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: SIMLI dualisation/reorganisation project

Potential City Pairs:

ATS ROUTE NAME: FE0029 / RDGE 18.031 / APAC RUS13

Requested by : IATA / RUS

ENTRY/EXIT POINT

ROUTE DESCRIPTION

Implementation of new uni-directional eastbound ATS route segment:
SIMLI –
new waypoint 4920N 12706E –
UGABI

FLIGHT LEVEL BAND

PRIORITY: HIGH/MED/LOW

PLANNED IMPLEMENTATION DATE

CHART

Action Required	IATA
	ICAO Coordination Russian Federation, China

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: SIMLI dualisation/reorganisation project

Potential City Pairs:

ATS ROUTE NAME: FE0035 / RDGE 18.030 / APAC RUS15 Requested by : IATA / RUS

ENTRY/EXIT POINT **ROUTE DESCRIPTION** Implementation of new uni-directional westbound ATS route segment: **UGABI –** **new waypoint 493236N 1281936E –** **AMERA –** **WZ** **FLIGHT LEVEL BAND** **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE**	**CHART** 

Action Required	IATA
	ICAO Coordination Russian Federation, China

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: SIMLI dualisation/reorganisation project

Potential City Pairs:

ATS ROUTE NAME: FE0041 / RDGE 19.018 Requested by : IATA / RUS

ENTRY/EXIT POINT **ROUTE DESCRIPTION** Implementation of 2 new uni-directional ATS route segments: **a. eastbound unidirectional traffic via NALEB – SIMLI – HEK – 492000N 1270600E – BISUN – SANAR – ARLAS – new waypoint on FIR border – new EKVIK** **b. westbound unidirectional traffic via new EKVIK – new waypoint on FIR border – ARLAS – SANAR – BISUN – new waypoint 493236N 1281936E – AMERA – WZ – NALEB** **FLIGHT LEVEL BAND** **PRIORITY:** HIGH/MED/LOW **PLANNED IMPLEMENTATION DATE**	**CHART**

Action Required	IATA
	ICAO Coordination Russian Federation, China

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks: SIMLI dualisation/reorganisation project, further improvement of north-south traffic flows between Khabarovsk FIR and Fukuoka FIR, alternative proposal to APAC RUS6,

Potential City Pairs:

ATS ROUTE NAME: RUS 3 Requested by : IATA

ENTRY/EXIT POINT **XXXXX** **ROUTE DESCRIPTION** **Muraveyka (BG) .. TELOD .. XXXXX .. Gangwon (KAE)** **FLIGHT LEVEL BAND** **28000 – 46000 feet** **PRIORITY: HIGH/MED/LOW** **“XXXXX” Approx N38 38.0 E129 24.7**	**CHART**

Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Remarks

Potential City Pairs: North America- Inchoen

ATS ROUTE NAME: *RUS 4*
REQUESTED BY: IATA

ENTRY/EXIT POINT **ROUTE DESCRIPTION** **AVGOK-GTC** **FLIGHT LEVEL BAND** **PRIORITY:** **States concerned** JAPAN RUSSIAN FEDERATION	**CHART**

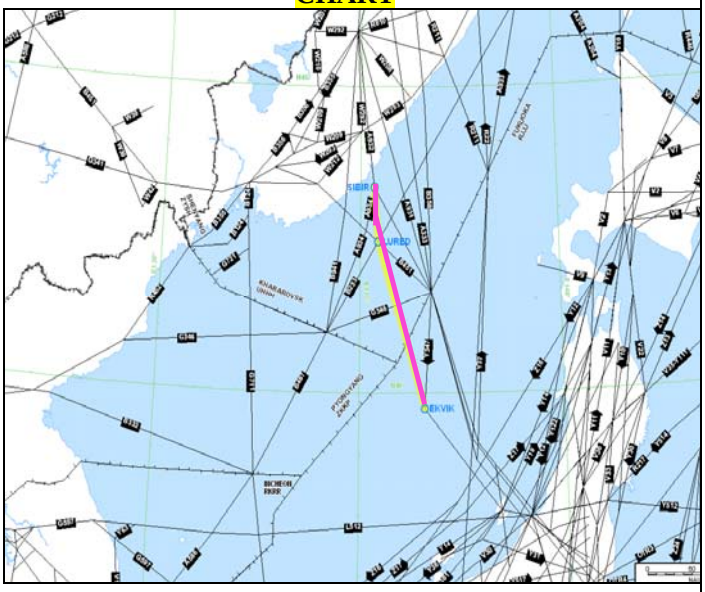
Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Russian Federation: Further discussion with Japan required through the ICAO APAC Office.

Objective:
To reduce route distance of 13 NM as compared to current routing AVGOK-KADBO-RJSN.

ATS ROUTE NAME: *RUS 5*
REQUESTED BY: IATA /RUSSIA

ENTRY/EXIT POINT **ROUTE DESCRIPTION** bidirectional ATS route **SIBIR – LURED – EKVIK.** **FLIGHT LEVEL BAND** **PRIORITY:** **States concerned** JAPAN RUSSIAN FEDERATION	**CHART** 

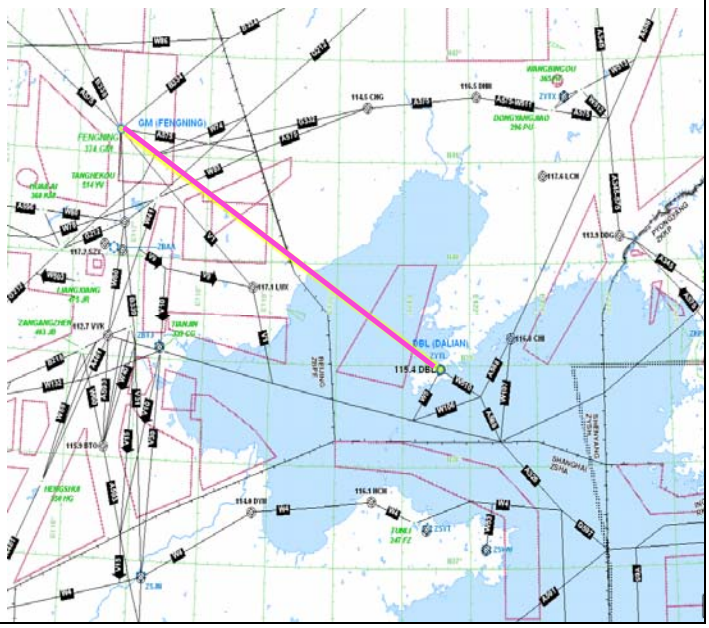
Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Russian Federation: New waypoint needed 404751N1361021E (FIR Boundary), coordination with Japan (Fukuoka FIR) required.
Alternative bi-directional route to EN15. Implementation planned for 2Q 2013.

Objective:
To improve north-south traffic flows between Khabarovsk FIR and Fukuoka FIR.

ATS ROUTE NAME: *CHA13*
REQUESTED BY: IATA

ENTRY/EXIT POINT **ROUTE DESCRIPTION** **FLIGHT LEVEL BAND** **GM - DBL.** **PRIORITY:** **States concerned** CHINA	**CHART** 

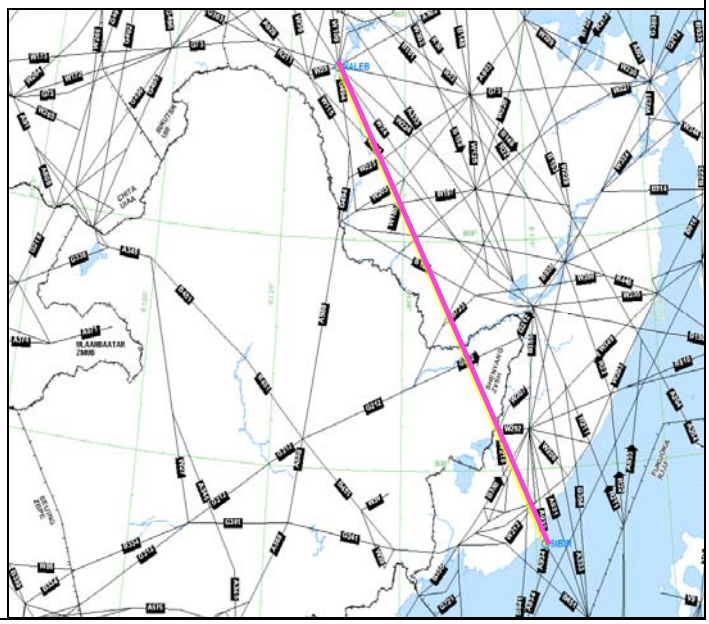
Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Part of IATA EUR-North Asia package - #EN13.

China: Further discussions required via ICAO APAC Office.
Objective:
To reduce route distance of 67 NM as compared to current routing GM-LADIX-MAKNO.

ATS ROUTE NAME: *RUS 6*
REQUESTED BY: IATA

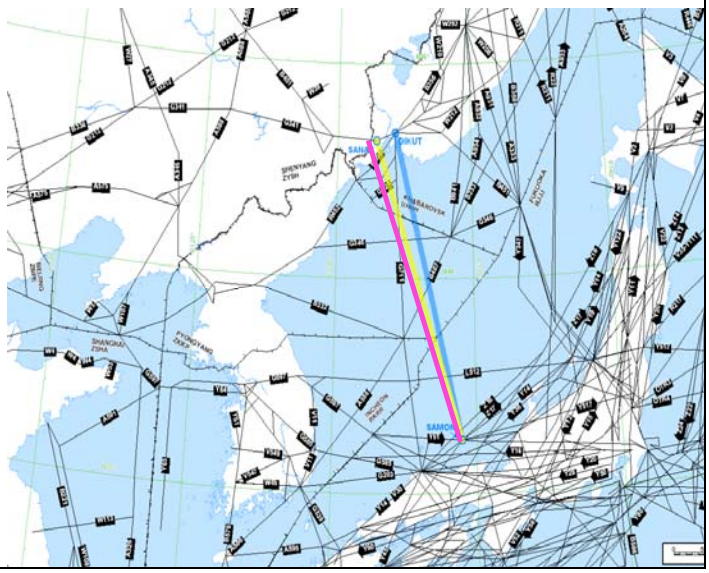
ENTRY/EXIT POINT **ROUTE DESCRIPTION** **FLIGHT LEVEL BAND** **NALEB - SIBIR.** **PRIORITY:** **States concerned** CHINA RUSSIAN FEDERATION	**CHART** 

Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Part of IATA EUR-North Asia package - #EN6.
Objective:
To reduce route distance of 63 NM as compared to current routing LALIR-SOVIK-HAB-TD-SIBIR.

ATS ROUTE NAME: *RUS 7*
REQUESTED BY: IATA

ENTRY/EXIT POINT	**CHART**
ROUTE DESCRIPTION ATS route segment **DIKUT** or **SANAR - SAMON**. **FLIGHT LEVEL BAND** **PRIORITY:** **States concerned** JAPAN RUSSIAN FEDERATION DEM. PEOPLE'S REP. OF KOREA	

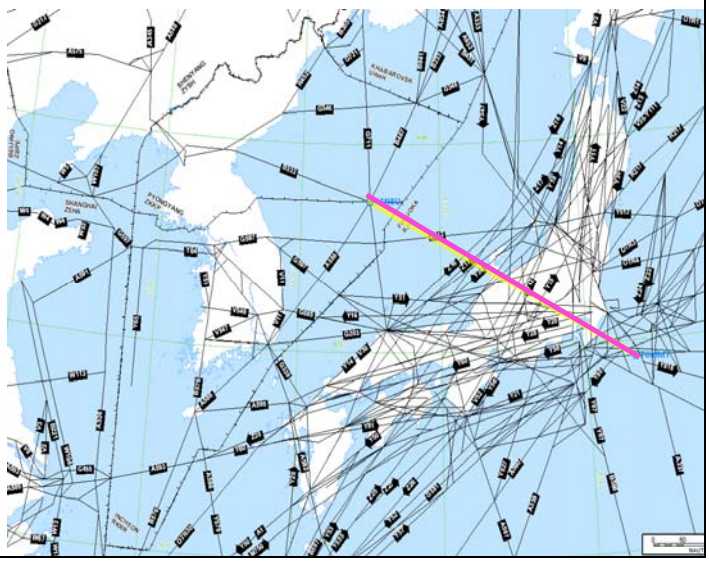
Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Part of IATA EUR-North Asia package - #EN9.

Russian Federation: Further discussion/studies required. Difficult to implement.
Objective:
To reduce route distance of 160 NM as compared to current routing DIKUT-KANSU-JEC.

ATS ROUTE NAME: *RUS 8*
REQUESTED BY: IATA

ENTRY/EXIT POINT **ROUTE DESCRIPTION** **KANSU - TOMMY**. **FLIGHT LEVEL BAND** **PRIORITY:** **States concerned** KOREA JAPAN	**CHART** 

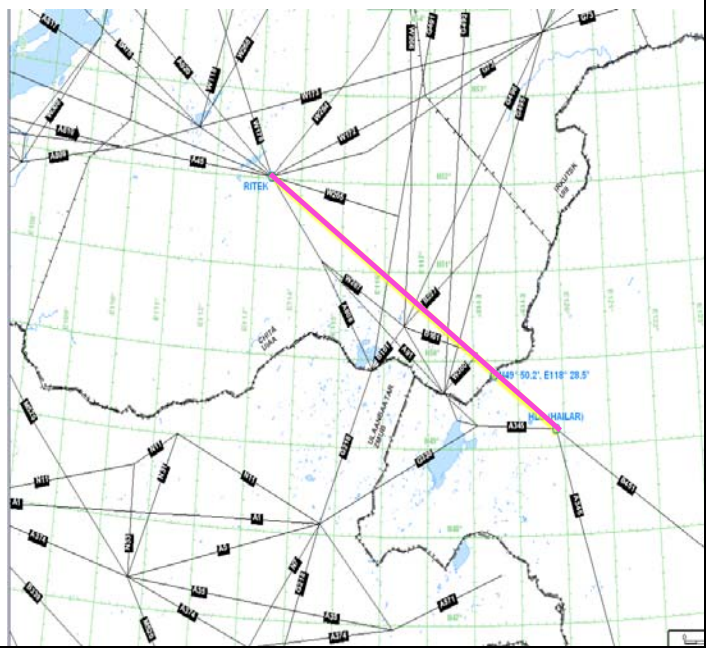
Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Part of IATA EUR-North Asia package - #EN14.

China: Further discussion between China and Korea also required via ICAO APAC Office.
Objective:
To reduce route distance of 64 NM as compared to current routing KANSU-IGRAS-TOMMY.

ATS ROUTE NAME: *RUS 9*
REQUESTED BY: IATA/RUSSIA

ENTRY/EXIT POINT	**CHART**
ROUTE DESCRIPTION **RITEK- new waypoint 495025N 1182854E - HLD** **FLIGHT LEVEL BAND** **PRIORITY:** **States concerned** CHINA RUSSIAN FEDERATION	

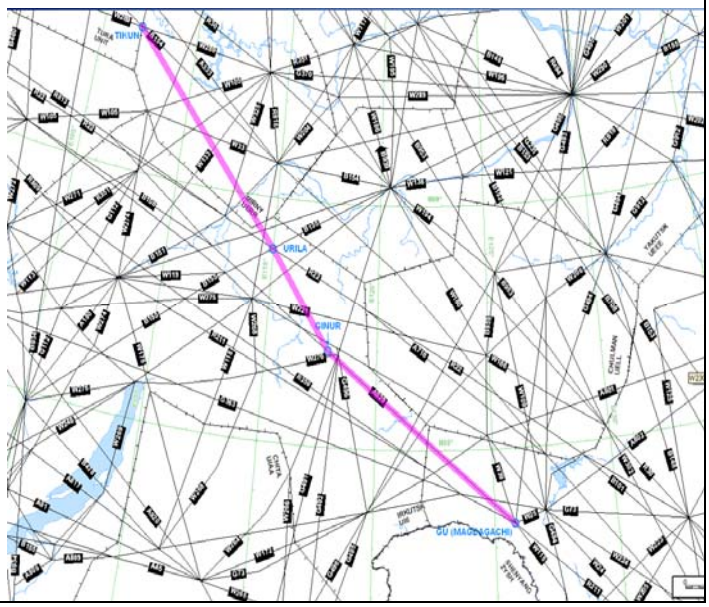
Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Further studies/coordination required. Updates will be given when available.

Alternative uni-directional eastbound route proposal for EN11, proposal 13.035 (deleted from catalogue).
Objective:
To reduce route distance of 159 NM as comparred to current routing PTG-RITEK-HLD-DIKUT-KANSU

ATS ROUTE NAME: *RUS 10*
REQUESTED BY: IATA/RUSSIA

ENTRY/EXIT POINT **ROUTE DESCRIPTION** **TIKUN - URILA - GINUR - GU.** **FLIGHT LEVEL BAND** **PRIORITY:** **States concerned** CHINA RUSSIAN FEDERATION	**CHART** 

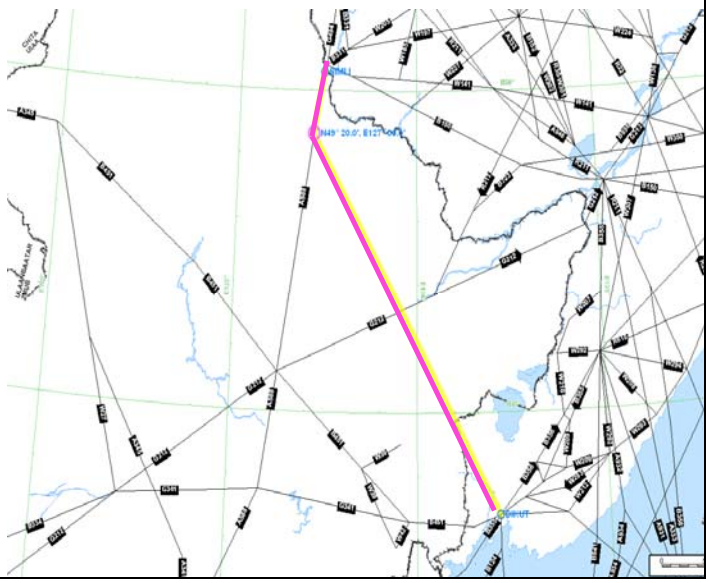
Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Part of IATA EUR-North Asia package - #EN10.

China: Proposal can partly be withdrawn due to lack of CNS capabilities for the segment URILA-492000N1270600E. Alternative proposal made.
Russian Federation: Further studies/discussion required.
Objective:
To reduce route distance of 150 NM as compared to current routing TIKUN-IVADA-TD-DIKUT.

ATS ROUTE NAME: *RUS 11*
REQUESTED BY: IATA/RUSSIA

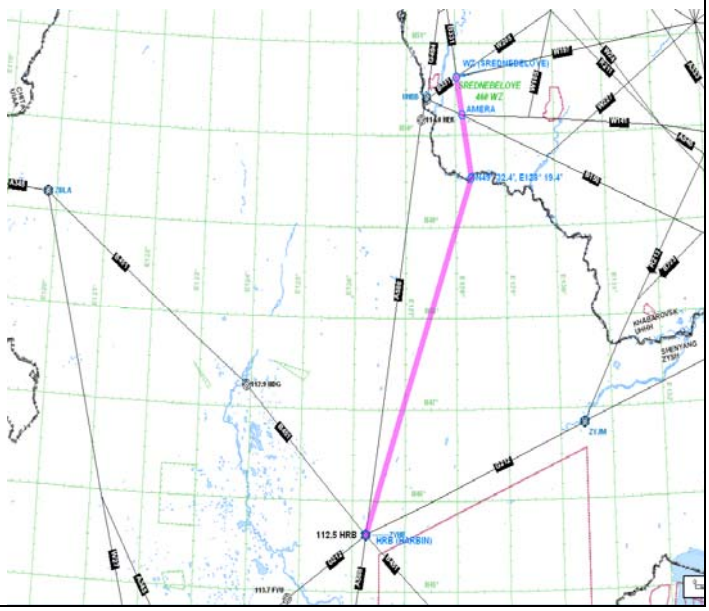
ENTRY/EXIT POINT	**CHART**
ROUTE DESCRIPTION **SIMLI - new waypoint 492000N 1270600E - DIKUT**. **FLIGHT LEVEL BAND** **PRIORITY:** **States concerned** CHINA RUSSIAN FEDERATION	

Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Further studies/coordination required. Updates will be given when available.
Objective:
To reduce route distance of 150 NM as compared to current routing TIKUN-IVADA-TD-DIKUT.

ATS ROUTE NAME: *RUS 12*
REQUESTED BY: IATA/RUSSIA

ENTRY/EXIT POINT **ROUTE DESCRIPTION** Unidirectional Westbound route **HRB - 493236N 1281936E - AMERA – WZ** **FLIGHT LEVEL BAND** **PRIORITY:** **States concerned** CHINA DEM. PEOPLE'S REP. OF KOREA RUSSIAN FEDERATION	**CHART** 

Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Russian Federation: westbound ATS route is needed for unloading traffic from SIMLI

ATS ROUTE NAME: *RUS 13*
REQUESTED BY: IATA/RUSSIA

ENTRY/EXIT POINT	**CHART**
ROUTE DESCRIPTION unidirectional Eastbound route **SIMLI - HEK - 492000N 12706E - LEPNI - 422624.7N 1294454.7E - KANSU** **FLIGHT LEVEL BAND** **PRIORITY:** **States concerned** CHINA DEM. PEOPLE'S REP. OF KOREA RUSSIAN FEDERATION	

Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Russian Federation: eastbound ATS route is needed for unloading traffic from SIMLI.
China: Confirmation of interest in this ATS route but further studies/coordination are needed, updates will be given when available.

ATS ROUTE NAME: *RUS 14*
REQUESTED BY: IATA/RUSSIA

ENTRY/EXIT POINT **ROUTE DESCRIPTION** **FLIGHT LEVEL BAND** **PRIORITY:** **States concerned** CHINA DEM. PEOPLE'S REP. OF KOREA RUSSIAN FEDERATION	**CHART** 

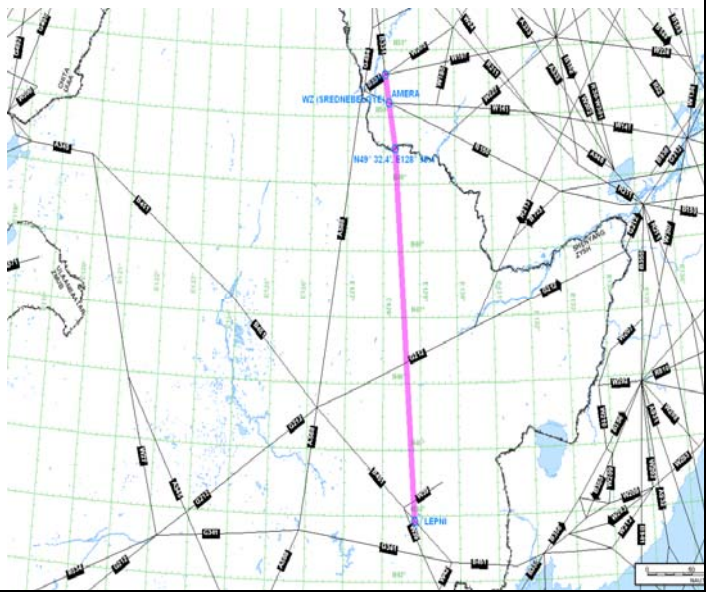
Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Alternative bi-directional route

Objective:
To reduce route distance of 159 NM as compared to current routing PTG-RITEK-HLD-DIKUT-KANSU.

ATS ROUTE NAME: *RUS 15*
REQUESTED BY: IATA/RUSSIA

ENTRY/EXIT POINT	**CHART**
ROUTE DESCRIPTION Westbound ATS route **LEPNI 435542N 1285030E - new waypoint 493236N** **FLIGHT LEVEL BAND** **PRIORITY:** **States concerned** CHINA RUSSIAN FEDERATION	

Action Required	IATA
	ICAO

Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

Further studies/coordination required. Updates will be given

Chapter 4: Pacific

(referred to: IPACG, ISPACG as appropriate for review)

ATS ROUTES	SIGNIFICANT PTS	COORDINATES	FIR	REMARKS
WPC 1	PY VNO ROR ENDAX ELMAS TINHO	S0927.2 E14712.9 S0240.7 E14118.2 N0722.1 E13433.0 N1415.0 E13000.0 N2027.0 E12500.0 N2421.2 E12201.7	PT MORESBY PT MORESBY OAKLAND MANILA MANILA TAIPEI	
R582	KRILL MAITO Tahiti PAERE TOLAB TAMUR TIERE TARAO TUNBA TIAMU	2016.1N 15700.0E 1732.8S 14936.1E 1625.0S 14752.6W 1428.0S 14500.0W 1104.0S 14000.0W	Auckland Ocn/Tahiti Tahiti Tahiti Tahiti Tahiti Tahiti Tahiti Tahiti Tahiti Tahiti	Moved from Chapter 4. Route Requested by Tahiti

State AIS AIM Transition Table

Phase 1
P-03 — AIRAC adherence monitoring
P-04 — Monitoring of States' differences to Annex 4 and Annex 15
P-05 — WGS-84 implementation
P-17 — Quality

Phase 2
P-01 — Data quality monitoring
P-02 — Data integrity monitoring
P-06 — Integrated aeronautical information database
P-07 — Unique identifiers
P-08 — Aeronautical information conceptual model
P-11 — Electronic AIP
P-13 — Terrain
P-14 — Obstacles
P-15 — Aerodrome mapping

Phase 3
P-09 — Aeronautical data exchange
P-10 — Communication networks
P-12 — Aeronautical information briefing
P-16 —Training
P-18 — Agreements with data originators
P-19 — Interoperability with meteorological products
P-20 — Electronic aeronautical charts
P-21 — Digital NOTAM

AIS – AIM transition progress reported since AAITF/8 (May 2013)

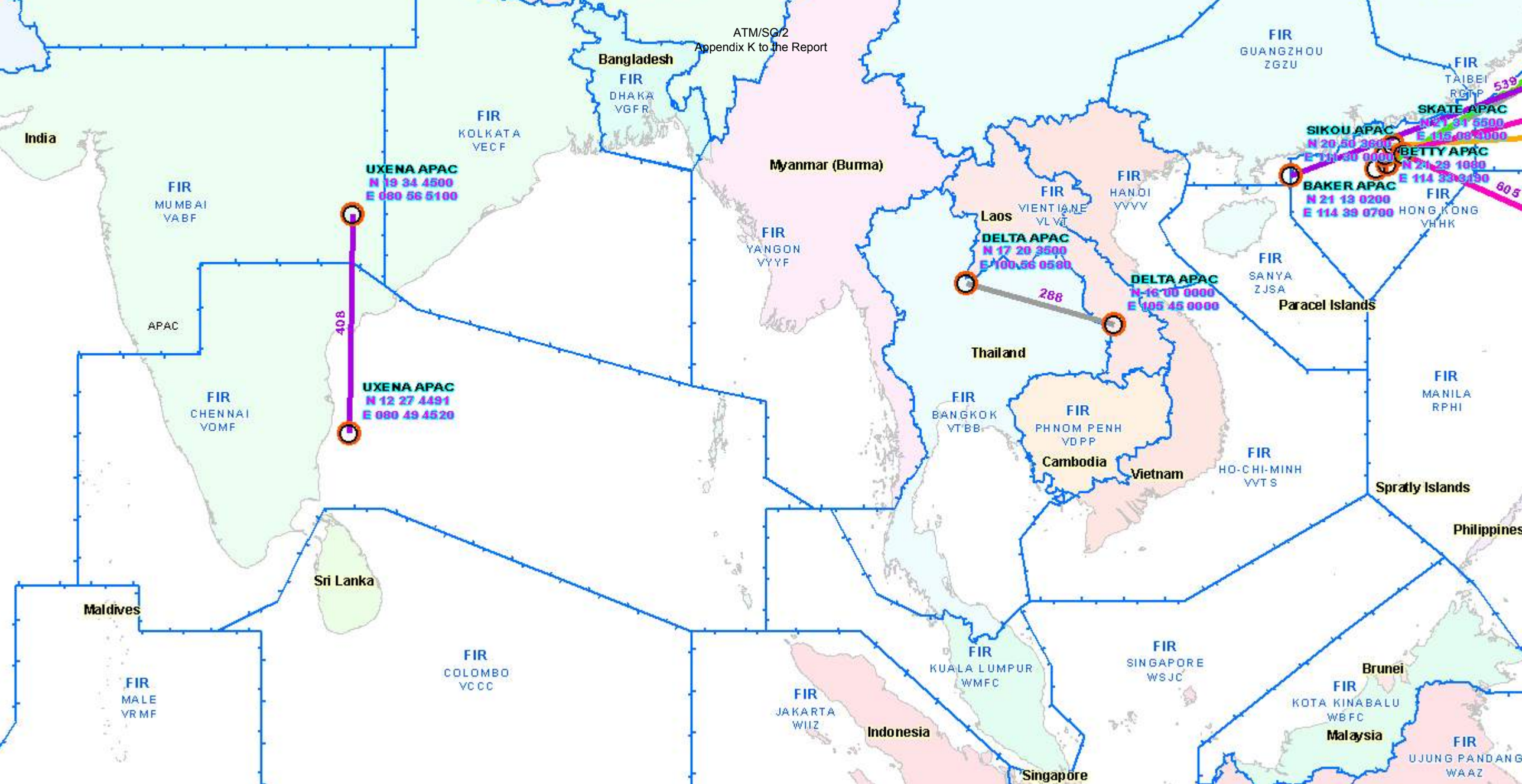
State Name = No reports since AAITF/8
√ = Completion previously reported
√ = completion reported
xx% = partial progress reported
= revised progress reported
Part = AIP Book, but no AIP SUP or AIC

Date Last Amended: 11 August 2014

	Phase 1 Consolidation (Am. 36 November 2010)				Phase 2 Going Digital (Amendment 37 November 2013)									Phase 3 Information Management (Amendment 38 November 2016)							
	P-03	P-04	P-05	P-17	P-01	P-02	P-06	P-07	P-08	P-11	P-13	P-14	P-15	P-09	P-10	P-12	P-16	P-18	P-19	P-20	P-21
Afghanistan										part											
Australia	√	√	√	√	80%	√	√	√	60%	Link	√	75%				10%	60%			90%	5%
Bangladesh	√	√	25%		60%	60%	70%	√		Part		60%			20%				20%		
Bhutan																					
Brunei Darussalam																					
Cambodia	√	√	√	10%						Part					70%		40%				
China	√	√	√	√						Link							√	√		√	
Hong Kong, China	√	√	√	√	√	√				Link	√	√					40%	√			
Macao, China	√	√	√	√						Link								√			
Cook Islands																	√				
DPR Korea			√																		
Fiji	√	√	√	√			√	√	√			√			√	√	√				
India	√	√	√	√	√	√	√	√	√	Link		√									
Indonesia	√	√	√		50%	50%	20%			Link					80%		60%	20%	10%	20%	
Japan	√	√	√	√	√	√	√	√	√	Link	80%	50%		80%	20%	60%	√	√		20%	20%
Kiribati																					
Lao PDR	√	√	25%																		
Malaysia	√	√	√	√	10%	10%	10%	100%	10%	Link	10%	10%		10%	15%	50%	10%			10%	
Maldives										Link											
Marshall Islands																					
Micronesia																					
Mongolia	√	√	√	√	√	√	√	80%	√	Link	65%	28%	5%	20%	10%	√	90%	√		√	
Myanmar	√	√	√	√	√	√	20%	20%	20%	Link	√	√	20%	20%	50%	50%	80%	80%	80%	80%	20%
Nauru																					
Nepal	√	√	√									30%	30%								
New Zealand	√	√	√	√	√	√	√	√	75%	Link	√	80%	15%	80%							
Niue (NZ)																					
Pakistan	√	√	√									√		√	√	√		√			√
Palau										part											
Papua New Guinea	√	√	√	90%				√								10%					
Philippines	√	√	60%	50%	√	50%	√	√	√	50%											
Republic of Korea	√	√	√	√	√			√	√								√	√		40%	90%
Samoa																					
Singapore	√	√	√	√	√	√	50%	√		Link	40%	40%	25%	√	√	√	√	√			
Solomon Islands			√																		
Sri Lanka	√	√	√	√			10%			Link					25%	25%	15%	25%			
Thailand	√	√	80%	40%	40%	30%				Link	25%	25%		10%	5%						
Timor Leste			√																		
Tonga		√	√	√																	
Vanuatu																					
Viet Nam	√	75%	√	25%	50%	50%	50%		√	Link				√	√		70%	50%			
USA[1]	√	√	20%	√	√	√	25%	√	50%	part	√	√	√	√	√		70%	√	25%	√	√
France[2]	√	√	√	√	√	√		√		Link											

[1] Includes American Samoa, Guam, Johnston, Kingman, Midway, Mariana, Palmyra, Wake
[2] Includes French Polynesia, New Caledonia, Wallis and Futuna Islands

PROXIMATE 5LNC DUPLICATES – ASIA/PACIFIC			
5LNC	**FIR**	**LATITUDE**	**LONGITUDE**
DELTA	VIENTIANE	N 16 00 0000	E 105 45 0000
DELTA	BANGKOK	N 17 20 3500	E 100 56 0580
ROBIN	HONG KONG	N 21 02 4500	E 114 16 0600
ROBIN	TAIBEI	N 25 25 0900	E 122 12 2800
SANDY	FUKUOKA	N 33 43 0995	E 130 21 3389
SANDY	INCHEON	N 37 29 2000	E 126 34 5900
BAKER	HONG KONG	N 21 13 0200	E 114 39 0700
BAKER	TAIBEI	N 25 38 3600	E 121 52 4800
OCEAN	HONG KONG	N 21 48 4300	E 114 48 4800
OCEAN	TAIBEI	N 22 07 4857	E 120 24 5803
BETTY	HONG KONG	N 21 29 1080	E 114 33 3190
BETTY	FUKUOKA	N 24 12 2014	E 125 18 0384
CHAMP	FUKUOKA	N 27 55 0709	E 128 32 0505
CHAMP	INCHEON	N 37 32 0200	E 126 33 3700
SEPIA	INCHEON	N 37 21 0900	E 126 05 4700
SEPIA	TAIBEI	N 25 29 1305	E 121 34 3173
SKATE	HONG KONG	N 21 31 5500	E 115 08 4000
SKATE	MANILA	N 17 22 1117	E 124 25 3655
HALMA	FUKUOKA	N 25 53 3496	E 130 42 4005
HALMA	TAIBEI	N 23 11 5536	E 120 13 4881
PERID	FUKUOKA	N 38 09 4480	E 141 07 4943
PERID	KHABAROVSK	N 49 20 2500	E 141 07 4943
QUEEN	FUKUOKA	N 31 13 3462	E 131 33 3657
QUEEN	FUKUOKA	N 26 08 2223	E 122 01 1348
SANKO	SHENYANG	N 38 15 0000	E 122 27 1200
SANKO	FUKUOKA	N 33 33 3443	E 131 16 1723
SIKOU	HONG KONG	N 20 50 3600	E 111 30 0000
SIKOU	TAIBEI	N 24 02 3291	E 119 58 4217
UXENA	CHENNAI	N 12 27 4491	E 080 49 4520
UXENA	MUMBAI	N 19 34 4500	E 080 56 5100


Bangladesh
FIR
DHAKA
VGFR
India
FIR
KOLKATA
VECF
FIR
MUMBAI
VABF
UXENA APAC
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APAC
UXENA APAC
N 12 27 4491
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FIR
CHENNAI
VOMF
Sri Lanka
Maldives
FIR
MALE
VRMF
FIR
COLOMBO
VCCC
Myanmar (Burma)
FIR
YANGON
VYYF
FIR
GUANGZHOU
ZGZU
FIR
TAIBEI
RCTP
539
SKATE APAC
N 21 31 5500
E 115 08 4000
SIKOU APAC
N 20 50 3600
E 116 30 0000
BETTY APAC
N 21 29 1000
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BAKER APAC
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HONG KONG
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HANOI
VVVV
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VIENTIANE
VLVT
Laos
DELTA APAC
N 17 20 3500
E 100 56 0580
288
DELTA APAC
N 16 00 0000
E 105 45 0000
FIR
SANYA
ZJSA
Paracel Islands
Thailand
FIR
BANGKOK
VTBB
FIR
PHNOM PENH
VDPP
Cambodia
Vietnam
FIR
HO-CHI-MINH
VVTS
FIR
MANILA
RPHI
Spratly Islands
Philippines
FIR
KUALA LUMPUR
WMFC
FIR
SINGAPORE
WSJC
Brunei
FIR
KOTA KINABALU
WBFC
Malaysia
FIR
JAKARTA
WIIZ
Indonesia
Singapore
FIR
UJUNG PANDANG
WAAZ

Mongolia
FIR ULAN BATOR ZMUB
FIR BEIJING ZBPE
FIR LANZHOU ZLHW
China
FIR WUHAN ZHWH
APAC
FIR KUNMING ZPKM
FIR GUANGZHOU ZGZU
FIR SHENYANG ZYSH
Russia
FIR KHABAROVSK UHHH
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North Korea
FIR PYONGYANG ZKKP
SANKO APAC
N 38 15 0000
E 122 27 1200
SEPIA APAC
N 37 21 0900
E 126 05 4700
CHAMP APAC
N 37 32 0200
E 126 33 3700
SANDY APAC
N 37 29 2000
E 126 35 5900
South Korea
FIR INCHEON RKRR
FIR SHANGHAI ZSHA
FIR FUKUOKA RJJJ
Japan
SANDY APAC
N 33 43 0995
E 130 21 3389
SANKO APAC
N 33 33 3443
E 131 16 1723
QUEEN APAC
N 31 13 3462
E 131 33 3657
CHAMP APAC
N 27 55 0709
E 128 32 0505
PERID APAC
N 38 09 4480
E 141 07 4943
HALMA APAC
N 25 53 3496
E 130 42 4005
BETTY APAC
N 24 12 2016
E 125 18 0384
QUEEN APAC
N 26 08 2223
E 122 01 1348
SEPIA APAC
N 25 29 1305
E 121 34 3158
SIKOU APAC
N 24 02 3291
E 119 58 4217
Taiwan
HALMA APAC
N 23 11 5535
E 120 13 4884
OCEAN APAC
N 22 07 4857
E 120 24 5803
SKATE APAC
N 21 31 5500
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SIKOU APAC
N 20 50 3600
E 116 30 0000
BETTY APAC
N 21 29 1080
E 114 33 3190
BAKER APAC
N 21 13 0200
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FIR TAIBEI RCTP
FIR YANGON VYYF
Vietnam
FIR VIENTIANE VLVT
FIR HANOI VVVV
DELTA APAC
N 17 20 3500
E 100 56 0580
Thailand
Laos
FIR SANYA ZJSA
FIR HONG KONG VHHK
FIR MANILA RPHI
Philippines
SKATE APAC
N 17 22 1117
E 124 25 3655
Paracel Islands
FIR OAKLAND OCEANIC KZOA
Northern Mariana Islands
577
663
498
455
632
676
646
662
312
605
288

FIR
YAKUTSK
UEEE

Russia

FIR
IRKUTSK
UIII

EURNAT

FIR
KHABAROVSK
UHHH

PERID EURNAT
N 49 20 2500
E 133 15 5200

FIR
MAGADAN/SOKOL
UHMM

FIR
ANCHORAGE OCEANIC
PAZA

Mongolia

FIR
ULAN BATOR
ZMUB

FIR
SHENYANG
ZYSH

676

China

FIR
BEIJING
ZBPE

North Korea

FIR
PYONGYANG
ZKKP

SANKO APAC
N 38 15 0000
E 122 27 1200

SEPIA APAC
N 37 21 0900
E 126 05 4700

577

CHAMP APAC
N 37 32 0200
E 126 33 3700

SANDY APAC
N 37 29 2000
E 126 35 5900

South Korea

APAC

FIR
INCHEON
RKRR

Japan

SANDY APAC
N 33 43 0995
E 130 21 3369

SANKO APAC
N 33 33 3443
E 131 16 1723

FIR
SHANGHAI
ZSHA

FIR
WUHAN
ZHWH

663

498

455

632

QUEEN APAC
N 31 13 3462
E 131 33 3657

PERID APAC
N 38 09 4480
E 141 07 4943

FIR
FUKUOKA
RJJJ

China

QUEEN APAC
N 26 08 2223
E 122 01 1348

SEPIA APAC
N 25 29 1305
E 121 34 3173

BAKER APAC
N 25 38 3600
E 121 52 4800

SIKOU APAC
N 24 02 3291
E 119 58 4217

478

510

646

Taiwan

HALMA APAC
N 23 11 5536
E 120 13 1881

BETTY APAC
N 24 12 2014
E 125 18 0384

Japan

539

662

OCEAN APAC
N 22 07 4857
E 120 24 5803

312

Hong Kong

Macau

BETTY APAC
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E 114 33 3190

SKATE APAC
N 21 31 5500
E 115 08 4000

ROBIN APAC
N 21 02 4500
E 114 16 0600

BAKER APAC
N 21 13 0200
E 114 39 0700

SIKOU APAC
N 20 50 3600
E 111 30 0000

605

SKATE APAC
N 17 22 1117
E 124 25 3655

Philippines

Paracel Islands

FIR
BEIJING

FIR
WUHAN

China

FIR
SHANGHAI

FIR
PYONGYANG

SEPIA APAC
N 37 21 0900
E 126 05 4700

South Korea

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291

FIR
INCHEON

Japan

SANDY APAC
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SANKO APAC
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QUEEN APAC
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FUKUOKA

632

CHAMP APAC
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QUEEN APAC
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HALMA APAC
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E 130 42 4005

SEPIA APAC
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ROBIN APAC
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E 122 12 2800

BAKER APAC
N 25 38 3600
E 121 52 4800

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SIKOU APAC
N 24 02 3291
E 119 58 4217

BETTY APAC
N 24 12 2014
E 125 18 0384

FIR
TAIBEI

HALMA APAC
N 23 11 5536
E 120 13 4081

Taiwan

FIR
GUANGZHOU

FIR
HONG KONG

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478

510

662

Hong Kong

SAR Capability Matrix (Last Update: 11 August 2014)

	Training	Alerting	Legislative	SAR Committee	SAR Agreements	Relationships	Communications	Quality Control	Civil Military	Resources	SAREX	Library	Computerisation	SAR Programme	Supply Dropping	Special Equipment	SAR aircraft	Navigation	ELTs	COSPAS-SARSAT Alerts
Afghanistan																				
Australia	A	A	A	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	B	A
Bangladesh	D	C	B	E	E	E	C	E	B	E	E	C	E	E	C	C	B	E	B	C
Bhutan																				
Brunei	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B	B	A	A	A	E
Cambodia	B	B	C	B	C	B	C	E	B	C	C	C	D	C	E	E	D	D	E	B
China	A	A	A	A	A	A	B	B	A	B	B	C	D	E	A	A	A	A	A	E
Cook Islands	E	D	D	E	E	C	C	C	D	E	D	E	E	E	E	D	D	E	A	E
DPR Korea	D	B	D	B	E	D	B	B	B	C	D	E	E	E	D	E	C	C	E	E
Fiji	D	C	C	C	C	C	C	D	B	C	B	C	E	C	D	E	C	C	C	E
French Polynesia	A	A	A	B	C	A	A	A	A	B	A	A	A	A	A	A	A	A	A	A
Hong Kong, China	A	A	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
India	B	C	C	C	D	C	C	E	C	C	C	C	C	B	B	B	C	E	A	A
Indonesia	A	B	A	A	A	B	B	B	A	B	A	B	B	B	C	B	B	B	B	B
Japan	A	A	A	A	B	A	A	A	A	A	A	A	B	A	A	A	A	A	A	A
Kiribati																				
Lao PDR	C	B	C	B	B	B	B	D	B	B	C	C	C	C	B	D	D	B	D	A
Macau, China	A	A	A	B	A	-	A	-	-	-	A	-	-	-	-	-	A	-	A	A
Malaysia	A	A	C	A	B	A	A	A	A	A	A	B	A	A	A	B	A	A	A	D
Maldives	C	A	C	E	B	A	B	C	A	C	B	B	B	A	C	C	C	A	C	A
Marshall Islands																				
Micronesia	C	D		E	E	D	C					E		D	D					

Mongolia	C	A	B	C	B	B	A	A	A	B	A	A	A	B	D	B	A	B	A	A
Myanmar	D	E	D	C	E	B	C	C	B	E	E	E	E	E	C	E	B	C	E	E
Nauru																				
Nepal	B	B	C	D	E	C	C	D	B	D	E	D	E	B	B	C	B	B	B	D
New Caledonia	C	B	B	B	C	B	A	E	A	C	C	D	E	E	A	B	A	A	A	A
New Zealand	A	A	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Pakistan	C	C	B	B	E	B	B	C	B	C	E	E	E	E	B	E	B	B	C	A
Palau																				
Papua New Guinea	B	A	B	C	B	B	C	C	B	C	C	B	C	C	C	E	E	E	A	E
Philippines	C	B	A	B	B	B	B	C	B	C	C	B	C	C	D	D	B	A	A	A
Republic of Korea	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Samoa																				
Solomon Islands																				
Singapore	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sri Lanka	A	A	A	A	D	B	A	B	A	B	B	A	D	B	B	B	C	B	A	A
Thailand	B	A	A	A	B	A	A	A	A	A	A	B	B	B	A	A	A	A	A	A
Timor Leste																				
Tonga	C	D	E	E	D	C	C	E	B	E	E	E	E	E	E	E	C	E	A	E
United States	A	A	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Vanuatu																				
Viet Nam	B	B	B	A	B	B	B	C	A	B	C	C	D	C	C	B	B	C	B	B

A = Fully meets Annex 12 requirements

B = Meets Annex 12 requirements in most areas

C = Meets Annex 12 requirements in some areas

D = Initial implementation

E = Not implemented

Blank = No response

*French Polynesia Process fully implemented by July 2013

SAR Matrix Element Descriptions

Training: The appropriate level and type of training for SAR coordinator, SAR mission coordinator, on-scene coordinator, and operational facilities. (IAMSAR Manual Vol. 1, Chapter 3)

Alerting: Fast and reliable means for the rescue coordination center to receive distress alerts. (IAMSAR Manual Vol. 1, Chapter 2)

Legislative: Statutes and related provisions that establish a legal foundation for establishing a SAR organization and its resources, policies, and procedures. (IAMSAR Manual Vol. I, Chapter 1)

SAR committee: Typically established under a national SAR plan, the SAR coordinating committee is comprised of SAR system stakeholders. (IAMSAR Manual Vol. 1, Chapter 6 and Appendix J)

Agreements : States should enter into agreements with neighboring States to strengthen SAR cooperation and coordination. (Chapter 3 – *Cooperation*, in both Annex 12 – Search and Rescue, and the International Convention on Maritime SAR)

Relationships: Close cooperation between services and organizations which may contribute to improving SAR service in areas such as operations, planning, training, exercises and research and development.

Communications: Communication capability for receipt of distress alerts and operational coordination among the SAR mission coordinator, the on-scene coordinator and SAR facilities. (IAMSAR Manual Vol. 1, Chapter 3)

Quality Control: Procedures to focus on improving the quality of SAR services so as to improve results and reduce costs. (IAMSAR Manual Vol. 1, Chapter 6)

Civil/Military: Close cooperation between the various civilian and military organizations.

Resources: The primary operational facilities made available to the national SAR system by various authorities and arrangements with others. (IAMSAR Manual Vol. 1, Chapter 5 and Appendix C)

SAR Exercise: Exercise to test and improve operational plans, provide learning experience and improve liaison and coordination skills. (IAMSAR Manual Vol. 1, Chapter 3; Annex 12, and Annex 14 regarding Airport Emergency Plan)

Library: Quick access to the applicable international, national, and agency SAR publications that provide standards, policy, procedures and guidance.

Computerization: Use of or access to output of various computer resources including databases, computer aids for SAR system management, search planning software, etc. (IAMSAR Manual Vol. 1, Chapter 2)

SAR programme: National structure to establish, manage and support the provision and coordination of SAR services. (IAMSAR Manual Vol. 1, Chapter 1)

Supply dropping: Supplies and survival equipment carried by air and maritime SAR facilities to aid survivors and facilitate their rescue, as appropriate. (IAMSAR Manual Vol. 1, Chapter 2 and Appendix B)

Special equipment: Equipment created for specific rescue scenarios (such as mountain or desert rescue) and equipment typically carried on designated SAR units to support coordination and locating functions as well as special supplies and survival equipment to aid survivors and facilitate their rescue. (IAMSAR Manual Vol. 1, Chapter 2 and 4)

SAR aircraft: An aircraft provided with specialized equipment suitable for the efficient conduct of SAR missions (Annex 12, Chapter 2 - *Organization*)

Navigation: Suitable means provided within the SAR region to determine position, and the responding SAR facilities have the appropriate equipment on board to determine their position in the SAR region they are likely to operate. (IAMSAR Manual Vol. 1, Chapter 2)

ELT: National regulations for carriage of ELTs, and arrangements for registration of the 406 MHz beacon and rapid access to the beacon registration database. (Annex 6 – Operation of Aircraft and Annex 10 - Aeronautical Telecommunications; and IAMSAR Manual Vol. 1, Chapter 4)

Cospas-Sarsat Distress Alerts : A SAR Point of Contact (SPOC) designated for receipt of Cospas-Sarsat distress data, and arrangements for efficient routing of the distress data to the appropriate SAR authority (the aeronautical emergency locator transmitter ELT), maritime emergency position-indicating beacon (EPIRB), and personal locator beacon (PLB)). (Annex 12, paragraph 3.2.5 and Section 2.4; and, IAMSAR Manual Vol. 1, Chapter 4)

Attachment L

SAR LOA Matrix **Date Last Amended**: 7 February 2013 (√ = SAR Agreement notified, blank cell = SAR Agreement not notified)

Administration	Afghanistan	Australia	Bangladesh	Bhutan	Brunei	Cambodia	China	Hong Kong	Macao	Cook Islands	DPR Korea	Fiji	French Polynesia	India	Indonesia	Japan	Kiribati	Lao PDR	Malaysia	Maldives	Marshall Is	Micronesia	Mongolia	Myanmar	Nauru	Nepal	New Caledonia	New Zealand	Niue (NZ)	Pakistan	Palau	PNG	Philippines	ROK	Samoa	Singapore	Solomon Is	Sri Lanka	Thailand	Timor Leste	Tonga	Vanuatu	Viet Nam	USA
1. Afghanistan																																											
2. Australia												√			√					√								√				√												
3. Bangladesh																								√																				
4. Bhutan														√																														
5. Brunei																			√																									
6. Cambodia																																										√	
7. China																																	√										√
8. Hong Kong, China																																												
9. Macao, China																																												
10. Cook Islands																												√																
11. DPR Korea																																												
12. Fiji																																												
13. French Polynesia																												√																
14. India																																												
15. Indonesia		√																	√												√	√			√			√			√	√
16. Japan																																√	√										√
17. Kiribati																																												
18. Lao PDR																																											√	
19. Malaysia					√										√																	√			√						√	
20. Maldives		√																																									
21. Marshall Islands																																												√
22. Micronesia																																												√
23. Mongolia																																											Note: has LOA with Russian Federation	
24. Myanmar																																												
25. Nauru																																												
26. Nepal																																												
27. New Caledonia																																												
28. New Zealand[1]		√								√			√														√		√							√							√
29. Niue (NZ)																																												
30. Pakistan																																												
31. Palau																																												√
32. Papua New Guinea		√													√																												
33. Philippines															√	√			√																	√			√				√
34. Republic of Korea							√									√																											
35. Samoa																												√																
36. Singapore															√				√														√				√				√	
37. Solomon Islands																																												
38. Sri Lanka																																												
39. Thailand															√				√														√				√				√	
40. Timor Leste																																												
41. Tonga																												√																
42. Vanuatu																																												
43. Viet Nam															√				√														√				√						
44. USA[2]															√	√												√																

[1] Also has an agreement with the Tokelau Islands and a SAR agreement with SAM State Chile

[2] Includes American Samoa, Guam, Johnston, Kingman, Midway, Mariana, Palmyra, Wake

ATM/AIS/SAR Deficiencies List (Updated 30 July 2014)

Identification		Deficiencies			Corrective Action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action****
WGS-84								
Requirements of Paragraph 3.7.1 of Annex 15	Afghanistan	WGS-84 - Not implemented	24/6/2014			Afghanistan	TBD	A
	Bangladesh	WGS-84 - Not implemented	24/6/2014			Bangladesh	TBD	A
	Bhutan	WGS-84 - Not implemented	2/7/1999	Data conversion completed, but not published		Bhutan	TBD	A
	Brunei Darussalam	WGS-84 - Not implemented	24/6/2014			Brunei Darussalam	TBD	A
	Cook Islands	WGS-84 - Not implemented	24/6/2014			Cook Islands	TBD	A
	Kiribati	WGS-84 - Not implemented				Kiribati	TBD	A
	Lao PDR	WGS-84 - Not implemented	24/6/2014			Lao PDR	TBD	A
	Maldives	WGS-84 - Not implemented	24/6/2014			Maldives	TBD	A

Identification		Deficiencies			Corrective Action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action****
	Marshall Islands	WGS-84 - Not implemented	24/6/2014			Marshall Islands	TBD	A
	Micronesia	WGS-84 - Not implemented	24/6/2014			Micronesia	TBD	A
	Nauru	WGS-84 - Not implemented		Conferring with consultant		Nauru	TBD	A
	Pakistan	WGS-84 - Not implemented	24/6/2014			Pakistan	TBD	A
	Palau	WGS-84 - Not implemented	24/6/2014			Palau	TBD	A
	Philippines	WGS-84 - Not implemented	24/6/2014			Philippines	TBD	A
	Samoa	WGS-84 - Not implemented	24/6/2014			Samoa	TBD	A
	Thailand	WGS-84 - Not implemented	24/6/2014			Thailand	TBD	A
	Vanuatu	WGS-84 - Implemented at main airports	2/7/1999			Vanuatu	1999	A
Airspace Classification								

Identification		Deficiencies			Corrective Action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action****
Requirements of Paragraph 2.6 of Annex 11	China	Airspace Classification - Not implemented	7/7/99		Difference to Annex 11 is published in AIP, China.	China	APANPIRG/19 updated, implementation planned by end 2010.	A
	Kiribati	Airspace Classification - Not implemented	7/7/99			Kiribati	TBD	A
	Nauru	Airspace Classification - Not implemented	7/7/99			Nauru	TBD	A
	Papua New Guinea	Airspace Classification - Not implemented	7/7/99			Papua New Guinea	Project in place	A
	Solomon Islands	Airspace Classification - Not implemented	7/7/99			Solomon Islands	TBD	A
AIP Format								

Identification		Deficiencies			Corrective Action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action****
Requirements of Chapter 4 of Annex 15	Cook Islands	AIP Format - Not implemented	7/7/99			Cook Islands	ATM/AIS/SAR/G/16 (June 2006) updated - AIP COOK ISLANDS in new format in progress with assistance of New Zealand	A
	Kiribati	AIP Format - Not implemented	7/7/99			Kiribati	ATM/AIS/SAR/SG/18 (June 2009) was advised AIP in draft stage	A
	Nauru	AIP Format - Not implemented	7/7/99			Nauru	ATM/AIS/SAR/SG/18 (June 2008) was advised work soon to start	A
	Papua New Guinea	AIP Format - Not implemented	7/7/99			Papua New Guinea	TBA	A
AIS Quality Management System								
Requirements of Paragraph 3.2.1 of Annex 15 Quality Management System - Not implemented	Afghanistan	AIS Quality Management System - Not implemented	24/6/2014			Afghanistan	TBD	A
	Bangladesh	AIS Quality Management System - Not implemented	24/6/2014			Bangladesh	TBD	A

Identification		Deficiencies			Corrective Action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action****
	Bhutan	AIS Quality Management System - Not implemented	24/6/2014			Bhutan	TBD	A
	Brunei Darussalam	AIS Quality Management System - Not implemented	24/6/2014			Brunei Darussalam	TBD	A
	Cambodia	AIS Quality Management System - Not implemented	24/6/2014			Cambodia	TBD	A
	Cook Islands	AIS Quality Management System - Not implemented	24/6/2014			Cook Islands	TBD	A
	DPR Korea	AIS Quality Management System - Not implemented	24/6/2014			DPR Korea	TBD	A
	Indonesia	AIS Quality Management System - Not	24/6/2014			Indonesia	TBD	A

Identification		Deficiencies			Corrective Action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action****
		implemented						
	Kiribati	AIS Quality Management System - Not implemented	24/6/2014			Kiribati	TBD	A
	Lao PDR	AIS Quality Management System - Not implemented	24/6/2014			Lao PDR	TBD	A
	Maldives	AIS Quality Management System - Not implemented	24/6/2014			Maldives	TBD	A
	Marshall Islands	AIS Quality Management System - Not implemented	24/6/2014			Marshall Islands	TBD	A
	Micronesia	AIS Quality Management System - Not implemented	24/6/2014			Micronesia	TBD	A

Identification		Deficiencies			Corrective Action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action****
	Nauru	AIS Quality Management System - Not implemented	24/6/2014			Nauru	TBD	A
	Nepal	AIS Quality Management System - Not implemented	24/6/2014			Nepal	TBD	A
	Pakistan	AIS Quality Management System - Not implemented	24/6/2014			Pakistan	TBD	A
	Palau	AIS Quality Management System - Not implemented	24/6/2014			Palau	TBD	A
	Papua New Guinea	AIS Quality Management System - Not implemented	24/6/2014			Papua New Guinea	TBD	A
	Philippines	AIS Quality Management System - Not	24/6/2014			Philippines	TBD	A

Identification		Deficiencies			Corrective Action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action****
		implemented						
	Samoa	AIS Quality Management System - Not implemented	24/6/2014			Samoa	TBD	A
	Solomon Islands	AIS Quality Management System - Not implemented	24/6/2014			Solomon Islands	TBD	A
	Thailand	AIS Quality Management System - Not implemented	24/6/2014			Thailand	TBD	A
	Timor Leste	AIS Quality Management System - Not implemented	24/6/2014			Timor Leste	TBD	A
	Vanuatu	AIS Quality Management System - Not implemented	24/6/2014			Vanuatu	TBD	A

Attachment M

Identification		Deficiencies			Corrective Action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action****
	Viet Nam	AIS Quality Management System - Not implemented	24/6/2014			Viet Nam	TBD	A

Attachment M

Identification		Deficiencies			Corrective Action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action****
SAR capability								
Requirements of Annex 12	Cook Islands	Annex 12 requirements not implemented. No agreements with adjacent States.	31/1/95		Cook Islands - implement Annex 12 requirements and co-ordinate LOA with adjacent States ICAO - assist to develop SAR capability and to co-ordinate with adjacent States	Cook Islands	2009. SAR agreement with New Zealand completed 2007.	U
	Maldives	Annex 12 requirements not implemented. No agreements with adjacent States.	24/4/97	SAR services and facilities provided (details to be confirmed). SAR agreements with neighbouring States under development	Maldives - implement Annex 12 requirements and co-ordinate LOA with adjacent States ICAO - assist to develop SAR capability and to co-ordinate with adjacent States	Maldives	2009	U
Non Provision of Safety-related Data								

Identification		Deficiencies			Corrective Action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action****
Requirement of Paragraph 3.3.5.1 of Annex 11 (provision of data for monitoring the height-keeping performance of aircraft)	Bangladesh	Annex 11 requirement not implemented.	11/9/09		Bangladesh - provide the safety-related data as required. Bangladesh advised ATM/AIS/SAR/SG/20 that the data were submitted to MAAR in 2008 and 2009. Thailand to confirm.	Bangladesh		U
	~~Lao PDR~~	~~Annex 11 requirement not implemented.~~	~~11/9/09~~	Status confirmed OK by MAAR and RASMAG Chair 30/07/2014	~~Lao PDR - provide the safety-related data as required.~~	~~Lao PDR~~	-	~~U~~
-	~~Papua New Guinea~~	~~Annex 11 requirement not implemented.~~	~~21/8/06~~	Status confirmed OK by AAMA and RASMAG Chair 30/07/2014	~~Papua New Guinea - provide the safety-related data as required.~~	~~Papua New Guinea~~	~~TBD~~	~~U~~
~~Carriage of ACAS II~~		-	-	-	-	-	-	-
~~Requirement of Chapter 6 of Annex 6~~	~~Bhutan~~	~~Annex 6 requirement not implemented.~~	~~26/8/05~~	-	~~Bhutan - implement Annex 6 as required.~~	~~Bhutan~~	~~TBD~~	~~U~~
	~~Cook Islands~~	~~Annex 6 requirement not implemented.~~	~~26/8/05~~	-	~~Cook Island - implement Annex 6 as required.~~	~~Cook Islands~~	~~TBD~~	~~U~~

Attachment M

Identification		Deficiencies			Corrective Action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action****
	~~Kiribati~~	~~Annex 6 requirement not implemented.~~	~~26/8/05~~	-	~~Kiribati - implement Annex 6 as required.~~	~~Kiribati~~	~~TBD~~	~~U~~
	~~Marshall Islands~~	~~Annex 6 requirement not implemented.~~	~~26/8/05~~	-	~~Marshall Islands - implement Annex 6 as required.~~	~~Marshall Islands~~	~~TBD~~	~~U~~
	~~Micronesia~~	~~Annex 6 requirement not implemented.~~	~~26/8/05~~	-	~~Micronesia - implement Annex 6 as required.~~	~~Micronesia~~	~~TBD~~	~~U~~
	~~Nauru~~	~~Annex 6 requirement not implemented.~~	~~26/8/05~~	-	~~Nauru - implement Annex 6 as required.~~	~~Nauru~~	~~TBD~~	~~U~~
	~~Palau~~	~~Annex 6 requirement not implemented.~~	~~26/8/05~~	-	~~Palau - implement Annex 6 as required.~~	~~Palau~~	~~TBD~~	~~U~~
	~~Papua New Guinea~~	~~Annex 6 requirement not implemented.~~	~~26/8/05~~	-	~~Papua New Guinea - implement Annex 6 as required.~~	~~Papua New Guinea~~	~~TBD~~	~~U~~
	~~Solomon Islands~~	~~Annex 6 requirement not implemented.~~	~~26/8/05~~	-	~~Solomon Islands - implement Annex 6 as required.~~	~~Solomon Islands~~	~~TBD~~	~~U~~

Identification		Deficiencies			Corrective Action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action****
	Vanuatu	Annex 6 requirement not implemented.	26/8/05	Pressure altitude reporting transponder required in all airspace since 1/1/00.	Vanuatu - implement Annex 6 as required.	Vanuatu	TBD	U
Carriage of Pressure Altitude Reporting Transponder								
Requirement of Chapter 6 of Annex 6	Bhutan	Annex 6 requirement not implemented.	26/8/05		Bhutan - implement Annex 6 as required.	Bhutan	TBD	U
	Cook Islands	Annex 6 requirement not implemented.	26/8/05		Cook Island - implement Annex 6 as required.	Cook Islands	TBD	U
	Kiribati	Annex 6 requirement not implemented.	26/8/05		Kiribati - implement Annex 6 as required.	Kiribati	TBD	U
	Marshall Islands	Annex 6 requirement not implemented.	26/8/05	ACAS II required.	Marshall Islands - implement Annex 6 as required.	Marshall Islands	TBD	U
	Micronesia	Annex 6 requirement not implemented.	26/8/05		Micronesia - implement Annex 6 as required.	Micronesia	TBD	U

Attachment M

Identification		Deficiencies			Corrective Action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action****
	~~Nauru~~	~~Annex 6 requirement not implemented.~~	~~26/8/05~~	-	~~Nauru - implement Annex 6 as required.~~	~~Nauru~~	~~TBD~~	~~U~~
	~~Palau~~	~~Annex 6 requirement not implemented.~~	~~26/8/05~~	-	~~Palau - implement Annex 6 as required.~~	~~Palau~~	~~TBD~~	~~U~~
	~~Papua New Guinea~~	~~Annex 6 requirement not implemented.~~	~~26/8/05~~	-	~~Papua New Guinea - implement Annex 6 as required.~~	~~Papua New Guinea~~	~~TBD~~	~~U~~
	~~Solomon Islands~~	~~Annex 6 requirement not implemented.~~	~~26/8/05~~	-	~~Solomon Islands - implement Annex 6 as required.~~	~~Solomon Islands~~	~~TBD~~	~~U~~