International Civil Aviation Organization

The Second Meeting of the APANPIRG ATM Sub-Group (ATM /SG/2)

Bangkok, Thailand, 04-08 August 2014

Agenda Item 5: ATM Coordination (Meetings, Route Development, Contingency Planning)

SAIOACG/4 and SEACG/21 Meeting Outcomes

(Presented by Secretariat)

SUMMARY

This paper presents an overview of the outcomes of the South Asia/Indian Ocean ATM Coordination Group (SAIOACG/4) and Twenty-First Meeting of the South-East Asia ATM Coordination Group (SEACG/21) meetings, which were held at Hong Kong, China from 24 to 28 February 2014. The meetings were combined with Co-Chairs from India and Hong Kong China.

1. INTRODUCTION

1.1 The combined SAIOACG/4 and SEACG/21 meeting was attended by 43 participants from Bangladesh, Cambodia, Hong Kong China, India, Indonesia, Lao PDR, Malaysia, Maldives, Philippines, Singapore, Sri Lanka, Thailand, United States, Viet Nam, IATA, IFALPA, IFATCA, and ICAO.

1.2 There were 23 Working Papers (WP), 13 Information Papers (IP), and 3 Flimsy considered by the meeting.

2. DISCUSSION

Relevant Meeting Outcomes

2.1 In discussing the outcomes from the Regional Airspace Safety Monitoring Advisory Group (RASMAG/18), Malaysia advised the SAIOACG4/SEACG21 meeting that the Flight Level Orientation Scheme (FLOS) transition in their airspace had caused Large Height Deviations (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, but recognised that the South China Sea (SCS) system was put in place to address a specific capacity need some years ago.

2.2 The SAIOACG4/SEACG21 meeting noted the slow progress of AIS – AIM transition based on the AIS-AIM Roadmap reported to the Aeronautical Information Management Implementation Task Force (AAITF/8). The SAIOACG4/SEACG21 meeting noted that the AAITF agreed that the Deficiencies List should be updated to record AIS – AIM related deficiencies where States have reported that they have not yet completed Phase 1 Steps, or where they have failed to provide any progress reports.

2.3 Regarding ATM improvement programmes driven by the Seamless ATM Plan, IATA asked for clarification regarding the Indonesian plan for an ADS-B mandate in 2016. Indonesia was formulating a workshop and task force to discuss operational and technical aspects of the ADS-B implementation. The SAIOACG4/SEACG21 meeting noted IATA's concern at the truncated schedule for domestic and Low Cost Carriers (LCCs).

SAIOACG/SEACG Small Working Group Updates

2.4 Small Working Groups (SWG) were formed by SAIOACG/2 and SEACG/19 to make recommendations that assisted implementation in accordance with the Asia/Pacific Seamless ATM initiatives, related to the Air Traffic Flow Management (ATFM), Communication (COM) and ATS Surveillance (SUR) fields. Key SWG actions were reviewed and the SAIOACG4/SEACG21 meeting was updated on any progress.

Enhancing En-route Capacity over the Bay of Bengal

2.5 Malaysia and Singapore presented ATM solutions to enhance en-route capacity over the Bay of Bengal, given the continued growth of air traffic between South East Asia - South Asia and beyond. The current No Pre-departure Coordination (NPDC) flight level system allocated for westbound flights on routes crossing the Bay of Bengal had resulted in a number of flight levels being unavailable on certain routes, and was an inefficient system. In addition, the Bay of Bengal Cooperative ATFM System (BOBCAT) had managed air traffic flow within the Kabul FIR for years, but the procedures resulted in bunching at segments with constricted en-route capacity.

2.6 The westbound departures to the Middle East and South Asia were not part of the BOBCAT ATFM procedures departing from Malaysia and Singapore. These flights were typically assigned FL280 and FL300 NPDC, spaced 10 minutes apart given the procedural separation applied over the Bay of Bengal. Some flights had to delay departure for up to 40 minutes as they waited to depart at the required intervals of 10 minutes. There were also occasions where tropical cyclone would severely impact the operations and efficiency of flights over the Bay of Bengal. During such periods, some routes would not be available leading to converging flights and further compounding the issue of limited flight levels.

2.7 The meeting noted that with the advent of Automatic Dependent Surveillance – Broadcast (ADS-B), enhanced surveillance coverage over the Bay of Bengal could allow the application of more efficient surveillance-based separations in the area. India advised that Port Blair ADS-B would be operational in April 2014. IFATCA noted the current Flight Level Allocation System (FLAS) was implemented some time ago. The meeting agreed that the majority of issues would be solved by ATS surveillance, and then there should be no need for the FLAS.

Capacity Enhancements in SAIOACG Airspace

2.8 Thailand's paper also considered the capacity of Bay of Bengal airspace from the perspective of ATS route planning, describing how an improved ATS unidirectional route structure with more parallelism in an improved communications and surveillance environment may allow removal of the FLAS. Thailand announced that it would complete ADS-B testing by the end 2014 and exchange data with Singapore, Malaysia and Myanmar.

2.9 In tandem with approval of ICAO Asia-Pacific Seamless ATM Plan, informal ATM coordination groups such as supported the concept of en-route PBN harmonization, while selecting the RNAV5 specification in surveillance airspace for November 2015 with transition to RNP 2 in November 2018.

2.10 It was noted that 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. At a minimum, RNAV 5 in airspace covered by communications and surveillance (Category S airspace) and RNP 4 or RNAV/RNP 10 outside communications and/or surveillance coverage (Category R airspace) were selected, both with the aim to transition to RNP 2 in 2018.

2.11 The SAIOACG4/SEACG21 meeting also noted that the RNAV 2 navigation specification had a number of advantages over RNAV 5, including the use of a database and auto waypoint sequencing for greater track-keeping assurance, and the ability to use the standard outside Very High Frequency (VHF) range using Controller Pilot Data-Link Communications (CPDLC). This prompted the development of a Flimsy (**Appendix A**) which presented the basic differences between Performance-based Navigation (PBN) specifications.

2.12 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 occurs within 50NM of FIR boundaries, or if ATS surveillance coverage did not overlap the FIR Boundary concerned, or ATS surveillance data is not exchanged between ATC units concerned. Given that route structure enhancements were expected to move routes into communications and surveillance coverage once Myanmar ADS-B became operational, it was proposed that the FLAS restriction on those route structures be removed, and the FLAS on the remaining ATS routes within the Bay of Bengal be reviewed in order to support expected future traffic growth.

Airport CDM – Adverse Weather and Fog Operations

2.13 India provided information on their use of Airport Collaborative Decision Making (A-CDM) in adverse conditions and fog. They noted that New Delhi was affected severely by fog despite having a CAT IIIB Instrument Landing System (ILS). The A-CDM process for departures in fog was implemented in November 2011, significantly improving the situation. From 2014, this process would also include arrival and diversion management, and would be used in all adverse conditions, such as fog, thunderstorms and dust storms.

2.14 India also provided further information on India's effort in the development of an A-CDM platform as a pilot project at Mumbai airport. This tool will be useful for many stakeholders, and would also serve the general public with timely and accurate flight updates.

2.15 The next stage of the project would be the generation of EIBT (Expected In Block Time), which required reliable, real time data source of arriving aircraft. Subsequently, this project would be extended to other large Indian airports and integrated into a single AAI portal, which would be beneficial for interaction with ATFM components.

Establishing a Harmonized Transition Altitude in India

2.16 India presented a proposal to enable a nationwide harmonised transition altitudes in accordance with Recommendation 5/1b of the ICAO Air Navigation Conference. The feasibility of a harmonised regional transition altitude (TA) was discussed with neighbouring States. This had also been briefly discussed at the ATM/SG/1 meeting (WP18, Pakistan).

2.17 The meeting was reminded that equal emphasis should be placed on what the lowest available flight level would be, dependent on the ambient QNH setting, so that 1,000ft separation was maintained between the highest altitude using QNH and the lowest flight level using 1013.2 hectopascals (hPa, QNE); therefore establishing a transition layer.

2.18 In this regard, India proposed a uniform transition level of FL 150. The meeting was informed that this was consistent with the transition layer in New Zealand, which was determined after considering the mountain heights, pressure gradients and the fact that non-oxygen flights were generally at 13,000ft or below. A comparative table of TA is shown in **Table 1**:

State	Transition Altitude (ft)
United Kingdom, Germany	5,000
Australia	10,000
Brunei, Sri Lanka, Malaysia, Maldives, Singapore, Thailand	11,000
India (proposed)	13,000
New Zealand	13,000
Nepal	13,500
United States and Canada	18,000 (17,500 highest altitude)

Table 1: Comparison of Transition Altitudes

2.19 The meeting was apprised of the situation in Europe, whereby the TA was proposed to be higher but this was not supported by all European States. While acknowledging the difficulties of changing a national standard, in general, the meeting noted the possibility and merits of a sub-regional South Asia TA in the order of 13,000ft and Southeast Asia TA of 11,000ft.

Google Project

2.20 The Secretariat presented information on Project Loon, a heavy free unmanned balloon project being trialled by Google, Inc. The project used high-altitude balloons in the stratosphere at an approximate altitude of 60,000ft (18 km), creating an wireless network with 3G-like Internet speeds.

Separation Minima and Airspace Capacity

2.21 ICAO presented information on separation standards applicable in airspace served by ATS surveillance, and their contribution to improvements in airspace capacity and efficiency. It included references to ICAO Standards and Recommended Practices as defined in ICAO Doc 4444 (PANS/ATM), 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.

2.22 It was recognised that extension of ATS surveillance coverage such as ADS-B brought a number of significant capacity, efficiency and safety benefits. The meeting noted that the benefits were achieved through the implementation or extension of ATS surveillance services, *where accompanied by implementation of surveillance based separation standards*. Other benefits included the improvement in ATC situational awareness from highly accurate, high update rate aircraft position and trajectory information, extension of ATM system safety net alerts for cleared level and route adherence, dangerous area and minimum safe altitude warnings and conflict alerts, display of aircraft generated emergency status and enhanced SAR alerting services through accurate real-time update of last observed aircraft position.

2.23 It was noted that 5NM and 3NM surveillance-based separation minima had been in global use for several decades, including in a number of Asia/Pacific States. The use of these minima provided a quantum leap in airspace capacity and efficiency, improved opportunity for flight at fuel efficient flight levels, and reduced ATC workload and task complexity. The introduction of advanced ATM automation systems had further improved ATC capacity. 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.

2.24 The Seamless ATM plan defined airspace categories according to its CNS capability or *potential* capability, with Category S meaning serviced (or potentially serviced) en-route airspace – by direct (not dependent on a CSP) ATS communications and surveillance. The Seamless ATM Plan Preferred ATM Service Levels (PASL) included the expectation to use the horizontal separation minima stated in ICAO Doc 4444 (PANS ATM), or as close to the separation minima as practicable.

2.25 IFATCA expressed their complete support of the paper, emphasizing the crucial importance of training to progress from an ATC to a modern ATM environment, and the need to know about pilot performance and aircraft capability. Hong Kong, China asked about the pilot training. IATA advised that their members were well aware of ADS-B, but some States needed to focus on training local pilots. Singapore advised that the ADS-B Implementation and Operations Guidance Document (AIGD) contained ADS-B related phraseologies for ATC. They advised that the LSWD procedures needed to be reviewed in light of the use of surveillance based separation.

2.26 IATA fully supported the principles of the paper, stressing the need to use the capability of the CNS systems. India asked for IATA's support for a greater carriage of FANS 1/A in aircraft. IATA advised that they advocated this to airlines but there was always an issue with legacy and narrow body aircraft, and LCC. IATA supported mandates where there was a service improvement. The meeting discussed the phased approach and recognised the possibility of moving to an RNAV 2 route system instead of using RNP 4 as a start, with progression to a higher performance specification at a later date.

ADS-B Implementation within the Singapore FIR

2.27 Singapore presented an update on the implementation of ADS-B within the Singapore FIR. On 6 November 2013, Singapore issued AIP Supplement 243/13 advising that from 12 December 2013, aircraft operating on ATS routes L642, M771, N891, M753, L644 and N892, at or above FL290 must carry a serviceable ADS-B and operational approval. Hong Kong, China ultimately supported exclusive ADS-B airspace. Singapore advised that State aircraft did not normally overfly the mandated ADS-B airspace within the Singapore FIR.

2.28 With the implementation of the enhanced ATS surveillance coverage, 5NM horizontal separation was applied for flights operating within the Singapore FIR. The extended surveillance coverage on ATS routes L642, M771, M753 and N892 allowed Singapore and Viet Nam to agree on a phased approach (from 50NM in 2013 to 20NM in 2015) to reduce longitudinal separation. India advised that they were using 5NM and 3NM within terminal airspace using ADS-B. The main issue for India was that the neighbouring States did not always accept the same standard.

2.29 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.

2.30 The meeting was informed by IATA that that space-based ADS-B was expected to be fully operational in 2017. However the costs to ANSPs were not known at this time.

2.31 Singapore stated that they had had a very low number of erroneous ADS-B operations. Prior to implementation Singapore noted an ADS-B equipage rate of 70%, but after implementation this had jumped to above 90%. Training for controllers on ADS-B operations was conducted as part of the Long Range Radar and Display System III (LORADS III) training.

2.32 Viet Nam announced that they had implemented ADS-B within the Ho Chi Minh FIR on 21 October 2013, while ATS routes M771 and L642 were being served by a radar separation of 10NM.

Thailand AIDC Implementation Airspace Capacity Enhancement

2.33 Thailand described their effort to enhance airspace capacity in the Bangkok FIR through the implementation of electronic aircraft handoff via AIDC with its neighbouring FIRs, along with the implementation of a new ATS system. They recalled that the Asia-Pacific Seamless ATM Plan, in accordance with PASL Phase 1 (November 2015), provided expectations for electronic aircraft transfer of control between ATC units via AIDC unless an alternate means of automated transfer of control was available. Moreover, Thailand recalled that this was in accordance with ASBU element B0-FICE, which was categorized as Priority 1 in the Asia-Pacific Seamless ATM Plan.

2.34 The meeting noted that Bangkok FIR's rapid air traffic growth (10–16% per annum from 2010 to 2013, 1,280 flights per day in 2010 to 1,900 flights per day in 2013) had put pressure on the ATM infrastructure. In an effort to support continued growth expected from the establishment of the ASEAN Economic Community (AEC) among the members of ASEAN in 2015, Thailand had procured a new ATS system, and was planning an operational trial in late 2015.

2.35 Informal ATM coordination groups such as Mekong ATM Coordination Group (MK-ATM/CG) and Group of Five ANSPs Informal ATM Coordination Group (G5) had agreed to implement AIDC among the participating States. The ATS system would support AIDC version 3 in accordance to the ICAO Asia-Pacific Seamless ATM Plan. Thailand intended to coordinate with all of its neighbours to implement AIDC at all FIR boundaries based on the following tentative schedule:

a) Phase 1: Operational Concept and Procedures Coordination (2014);

b) Phase 2: System Test and Verification (January – March 2015); and

c) Phase 3: Operational Trial and Implementation (April – October 2015).

2.36 Thailand expected that implementation of AIDC aircraft transfer of control would enable approximately 20% increase in airspace capacity enhancement 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. The meeting noted that the AIDC implementation schedule was dependent upon the success of ATS system operational trial and its implementation timeframe.

Implementation of LORADS III – New Singapore ATM System

2.37 Singapore provided information on the implementation of their new LORADS III ATM system to enhance safety and efficiency. LORADS III was capable of utilising multiple surveillance sources, including ADS-B equipped aircraft up to almost 500NM and communicate directly using VHF relay stations, well beyond the normal 250NM range of radars and radio. LORADS III introduces a new Java-based Human-Machine Interface (HMI), which was designed to help controller's work easier and more efficient with smart menus and highly configurable displays. The system had multiple modes and physical redundancy. It also featured new safety nets coupled with decision making tools (such as AMAN, which was integrated into the controller workstation). The next phase would introduce more advanced features such as Medium Term Conflict Alerts (MTCD).

Kuala Lumpur FIR ADSC/CPDLC Updates

2.38 Malaysia provided updated information on ADS-C and CPDLC operational performance, and 50NM implementation within the Kuala Lumpur FIR. An upgrade of the Kuala Lumpur ATS system was implemented in 2013 to enhance ATM capability.

2.39 Among the upgrades included the integrating of the CPDLC/ADS-C system into the main system. It was earlier planned to use a single server for all systems and to manage human resources constraints being faced at the Kuala Lumpur ACC. However the integration plan was not fully successful. It created deficiencies which led to split targets on ATC radar displays. Kuala Lumpur ACC was directed to revert back to a standalone system. This required more controller intervention and manual inputs to process all flights using ADS-C/CPDLC, and glitches during connection requests at the work station. Mitigating the outstanding problems became an issue, as these incurred additional costs outside the contract scope. Thus the operation was conducted only on opportunity basis.

2.40 These issues were raised last November in Hyderabad during the BOBASIO/3 meeting. It was noted during the meeting that, a mechanism should be put in place to take advantage of Chennai ACC's communication capability to assist should the issues within the Kuala Lumpur ACC system not be resolved in time. This might include agreement on an early communication transfer to Chennai ACC before the agreed TOC on real-time basis.

2.41 The problems had been rectified and the ADS-C/CPDLC operation had been back in operation since January 2014. Trials had been conducted and system was deemed to be stable, with a high rate of connectivity. The installation of a long range VHF on frequency 133.4 MHz had provided better communication with aircraft near the FIR boundaries; however its performance was still being monitored as there was some fading in reception for flights operating lower than FL340. This served as a back-up option if the CPDLC failed.

2.42 Training and refresher courses for controllers would be conducted to perform ADS-C/CPDLC operations, despite facing challenges with training for the new runway at Kuala Lumpur being in progress scheduled for 01 May 2014. This would involve major changes in instrument flight procedures and airspace layout within Kuala Lumpur Terminal Control Area.

2.43 Malaysia advised that it would continue to collect PRs, which it would send to the CRA for analysis. With the current system stability, Malaysia had implemented 50NM on current RNP10 routes, and supported the implementation of 30NM with India.

2.44 Indonesia added that the Jakarta ADS-C/CPDLC installation was advised as being trialed for six months by AIP Supplement (04/14) on 20 February 2014, before being operational. Unfortunately, the system was not integrated with the controller workstation, but Indonesia had a plan for integration at a later date.

2.45 Sri Lanka's informed that their ADS-C/CPDLC was operational. They wanted to remove the restriction on 50NM separations from India (because of upstream restrictions from Oman). India had a side meeting with Sri Lanka to resolve this issue. India and Sri Lanka agreed to accept 50NM on P570 and M300.

Implementation of RNP4 on L642 and M771 within the Hong Kong FIR

2.46 Hong Kong, China provided an update of the RNP 4 implementation in Hong Kong FIR (WP06). 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. Instead of the entire Hong Kong FIR at or above FL290, as stated in AIC 03/12, RNP4 approval would only be required for aircraft operating on L642 or M771 at or above FL290 by 11 December 2014. Non-RNP 4 approved aircraft requesting to operate on M771 or L642 at or above FL290 will be accommodated, subject to air traffic conditions ('non-exclusive airspace).

2.47 Hong Kong, China stressed that there was an operational benefit if an aircraft deviated significantly for weather. Under the current 60NM lateral route spacing, aircraft deviating off course for more than 10 NM were not separated, but with under an RNP4 environment, the aircraft deviating would remain separated as long as the weather deviation was not more than 30 NM resulted in a reduction of the frequency of LSWD procedure activations.

2.48 Hong Kong, China expected to regularly review the situation and consider expanding the scope of the restrictions progressively, to eventually implement exclusive RNP 4 airspace within the Hong Kong FIR when necessary conditions were satisfied.

Re-designation of ATS Routes A461 and A583 to RNP10

2.49 Hong Kong, China announced the proposal to re-designate of conventional ATS routes A461 and A583 to RNP10 routes to relieve the increasing traffic demand of the two routes between Hong Kong, China and the Philippines. It was estimated that route capacities of the two ATS routes would increase by over 35% by such re-designation with the subsequent ability to apply RNP-10 longitudinal separation.

2.50 Subject to the formal comment during the BANP amendment, Philippines and Indonesia agreed with the concept. IATA thanked Hong Kong for the paper. Hong Kong China would conduct a review of the traffic to determine whether an RNAV route overlay or an RNAV route replacement would be submitted.

Rationalization of Overflight Routes within the Hong Kong FIR

2.51 Hong Kong, China presented a plan to rationalise some overflight route segments within the Hong Kong FIR to reduce conflict points in the congested airspace and thereby improve flight safety. With an average of 10% annual growth of overflights in the Hong Kong FIR since 2010, the resultant exponential increase in traffic conflictions from the complex crossing tracks gave rise to safety concerns as well as impediments to the arrival and departure routes to and from Hong Kong. There was an urgent need to reduce the number of conflict points and the complexity of air traffic in Hong Kong FIR for the safe handling of the high level of traffic in the airspace.

2.52 Currently, overflights from Manila FIR through Hong Kong FIR to Guangzhou FIR could route via A583 SABNO to DOTMI A470 and also A461 NOMAN to BEKOL A461/G471. The two tracks resulted in flights crossing at same SCS westbound FLAS levels in a congested airspace sector that relied on a high degree of attention by air traffic controllers and timely intervention to resolve separation conflicts. To address this complexity and level conflicts, Hong Kong, China proposed to route flights from Manila FIR to BEKOL A461/G471 to route via A583 SABNO and those exited via DOTMI A470 to enter the Hong Kong FIR via A461 NOMAN. The crossing route segments SABNO – DOTMI and NOMAN - BEKOL were proposed to be withdrawn.

2.53 IATA expressed concern over the impact the change might have for certain city pairs in terms of additional flight distance. IATA agreed to conduct further analysis of the impact of the change and possible alternative arrangements. Hong Kong, China would provide the data for IATA to conduct further analysis.

2.54 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

2.55 The meeting discussed the situation at length, acknowledging that the difficulties being experienced by Hong Kong, China were valid but there needed to be urgent consideration of the short-term actions required to mitigate the risks, but also the longer term changes needed to address systemic causes, which included the abnormal FLOS.

2.56 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 using closely spaced RNAV 5, RNAV2 or RNP 2 routes, and 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 meeting agreed to the following Draft 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.

ATS Route Catalogue

2.57 The Secretariat presented draft Version 13 of the *Asia and Pacific Region ATS Route Catalogue* for review and update. Malaysia and India provided update comment. The meeting agreed to the following Draft Conclusion for consideration by the ATM Sub-Group and APANPIRG:

Draft Conclusion SAIOACG4/SEACG21-3: ATS Route Catalogue Version 13

That Version 13 of the *Asia and Pacific Region ATS Route Catalogue* replaces Version 12 on the Asia/Pacific Regional Office's web site.

2.58 Since the SAIOACG4/SEACG/21 meeting, there have been a number of amendments to Version 13, incorporating State requests since January 2014 and European trans-regional proposals. These have been highlighted in grey in the latest draft version at **Attachment A**.

Proposal to Implement 30NM Longitudinal Separation

2.59 India proposed to implement 30NM longitudinal separation between aircraft with FANS/1A data link capability on an opportunity basis within Bay of Bengal, Arabian Sea, and Indian Ocean airspace in a phased manner, then progress to implementing lateral separation to 30NM. As a first step, India expected to apply longitudinal separation on an opportunity basis for FANS/1A data link equipped aircraft on four routes: N571, M300, P570 and P574.

2.60 The successful leveraging of earlier work conducted by ISPACG by the implementation of RNP4 in the Brisbane and Melbourne FIR could be replicated in the Bay of Bengal and Indian Ocean area. Therefore, the opportunity existed for the regional implementation of RNP4 in the sub-region in order to achieve improvements in capacity, efficiency and environmental benefits similar to those achieved in the Brisbane and Melbourne FIRs. This implementation would also benefit air traffic controllers, particularly in climbing and descending aircraft clear of reciprocal traffic when both aircraft were data link equipped. In addition, the availability of additional separation minima would help air traffic controllers to accommodate more aircraft at optimum flight levels and to gain adequate experience prior to implementation of RNP4.

2.61 India further proposed that a small working group be constituted within SAIOACG to undertake the task of implementation of RNP 4 which would require the restructuring of the present route structure. It was expected that discussions between SAIOACG States and IATA using email would commence planning, and a SWG would be conducted at SAIOACG/5 to finalise this matter.

2.62 India has been making all possible efforts in applying 50NM separation across Indian FIRs, passing on the benefits to the operators. It concluded that with the introduction of 30NM longitudinal separation on the four routes, aircraft stood to benefit even if it was implemented only within the Indian FIRs. India urged all States to support this initiative.

2.63 The meeting noted that airspace should be declared as capable of utilising 50NM and 30NM separations when this is possible, not specific ATS routes and regardless of neighbouring State capability. Sri Lanka was planning to implement 30NM on M300 and P570, noting that at present the airspace was operated on a 'non-exclusive' basis. Malaysia advised that they could expedite more efficient separations on ATS routes N571 and P574 because of ATS surveillance coverage, and could release aircraft early if communications was an issue. The meeting thanked Malaysia for this initiative.

Collaborative PBN Implementation in the Sub-Region

2.64 India discussed changes to Indian airspace and route structures between July 2012 and October 2013. It further detailed plans for near term, including the plan to introduce RNAV2 ATS Routes between major airports including Delhi-Chennai extended to Colombo, Delhi-Bengaluru, Mumbai-Kolkata and Delhi-Kolkata, which might be extended to Dhaka.

2.65 In accordance with ICAO Global Plan Initiatives and recommendations of a various high level committees, India progressed with the implementation of Lateral Navigation/Vertical Navigation LNAV- VNAV and LNAV approach procedures, PBN RNAV-1 Standard Instrument Departures (SIDs) and Standard Terminal Arrivals (STARs) in terminal area and PBN based RNP10, RNAV5 and RNAV2 city-pair ATS routes.

2.66 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. PBN RNAV1 SIDs and STARs at 10 international airports have been implemented, which were being designed to facilitate Continuous Climb Operations (CCO) and Continuous Descent Operations (CDO). Although there may not be a significant savings due to reduction in track miles, India noted that city pairs connected by RNAV5 routes provided an opportunity to increase airspace capacity through the application of a 50NM longitudinal separation, in comparison to the use of 10 minute longitudinal separation.

2.67 India noted that the Republic of Korea had implemented RNAV 2 unidirectional routes with 8NM spacing and subsequently 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. India reaffirmed its commitment to introduce RNAV2 routes within continental airspace.

2.68 With the introduction of redundant ATS surveillance coverage and improved DCPC, the SAIOACG/SEACG meeting noted that RNAV 5 routes should be considered with respect to RNAV 2 and RNP 2 navigation specifications, which would become increasingly preferred in the near future. India was in the final stages of implementation of RNAV 2 city pairs with 20 NM lateral spacing between the routes, and a proposed 20NM longitudinal separation.

2.69 India considered the introduction of RNAV 2 ideal for routes between Delhi – Bengaluru – Trivandrum, Delhi – Chennai – Colombo and between Delhi – Kolkata – Dhaka , which will double available capacity. It was also expected that Delhi – Colombo RNAV2 would connect 12 Airports and Delhi – Dhaka RNAV2 would connect seven airports. India encouraged the development of PBN RNAV routes with neighbouring States in a collaborative manner.

2.70 IATA asked how many RNAV2 aircraft were using the airspace concerned. India informed that the aircraft operating on the proposed RNAV 2 routes were already RNAV 1 certified, and the certification for RNAV 2 was a technical formality. India also informed that the civil aviation requirement for RNAV 2 certification had already been published. IATA emphasised the need for educational material for pilots and airlines on what they need to do to take advantage of the changes. India agreed that educational material had to be provided, especially to general aviation and LCC operators. IATA noted that all new Boeing and Airbus aircraft were factory built to be capable of being approved for RNAV1 to RNP 10.

PBN Track Shortening Efficiency Case Study

2.71 The ICAO Regional Sub-Office presented an example of a case study conducted by the ICAO APAC Regional Sub-Office (RSO) to estimate the benefits of a direct track utilising PBN and draws to attention the need for collaboration among States to achieve such an outcome. ICAO had made available the ICAO Fuel Saving and Estimation Tool (IFSET) to be used to estimate fuel and carbon savings. This tool could be applied to quantify the benefit of ATM enhancement initiatives, such as introduction of more direct PBN routes and implementation of CDO/CCO procedures.

2.72 The expanding traffic between the domestic city pair between Hanoi and Ho Chi Minh City drew attention the benefits of providing a more efficient route by utilising technology such as PBN, compared to currently available conventional routes. To implement a more efficient direct track between the city pair, international coordination and collaboration were required as the direct track would form an international route passing through two additional neighbouring FIRs, namely Vientiane and Phnom Penh.

2.73 Using the ICAO IFSET tool, the potential fuel and carbon savings by implementing a direct route between Hanoi and Ho Chi Minh City would save airlines 200 kg of fuel and 630 kg of carbon emission per flight on a single aisle jet, and could yield approximately USD196 savings in the fuel cost. In addition, this case study estimates other savings in airline operating expenses, such as flight crew and maintenance costs indicated potential reduction of airline operating costs between USD 260 to USD346 per flight on a single aisle jet. However, air navigation charges had not been factored into the analysis, as this case study was only meant to highlight fuel and other operating costs savings through the implementation of PBN. The AATIP representative agreed to provide information on the cost assumptions used in the EUROCONTROL modelling used in the paper, so these could be customised using Asia/Pacific values.

2.74 Viet Nam elaborated that they had established a team to study the redevelopment of ATS route W1 from Ha Noi to Ho Chi Minh, in collaboration with JICA (Japan International Cooperation Agency). Viet Nam noted that the straight route proposed by the RSO in the WP21 study between the city pairs did not take into account the air navigation charges and the track mileage from SID/STAR procedures. The net saving in terms of fuel burn and emissions would be lower. Viet Nam were planning parallel routes contained within Viet Nam airspace.

Implementation of Flexible Use Airspace in India

2.75 India recalled that airspace was a national limited resource. On 08 March 2013, the Cabinet Committee on Security approved the proposal for FUA implementation in India and the constitution of a National High Level Policy Body (HLAPB) representing all civil and military service providers or users of airspace. A plan for the implementation of Flexible Use Airspace (FUA) has been submitted and accepted by the Ministry of Civil Aviation.

2.76 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. 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.

2.77 The paper highlighted the plan to introduce RNAV2 ATS Routes between major city pairs including Delhi-Chennai, Delhi-Bengaluru, Mumbai-Kolkata, and Delhi-Kolkata, and the Upper Airspace Harmonization Plan for the Delhi, Kolkata and Mumbai FIRs. The time frame for implementation of FUA, had three definitive phases:

a) December 2013: Implementation of FUA in Upper Airspace (FL 260 and above);

b) June 2014: Implementation of FUA in Lower Airspace (FL 150 to FL 255); and

c) December 2014: Implementation of FUA in terminal Airspace (below FL 150).

2.78 IATA emphasised the need to develop trust as a vital step to improving civil/military cooperation. Bangladesh described the positive progress made with civil/military cooperation for the effective utilisation of airspace in this context. Malaysia shared their civil/military cooperation experience which benefited the military with the release of airspace for military training. Hong Kong, China asked about the daily coordination process. India clarified that the civil/military representatives would be together in a separate Air Space Management Cell location but not in any of the ATS units for daily airspace allocation. The meeting acknowledged and congratulated India for the positive changes in civil/military cooperation.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper; and

b) discuss any relevant matters as appropriate.

…….

Appendix A: 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 14/10 – 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.

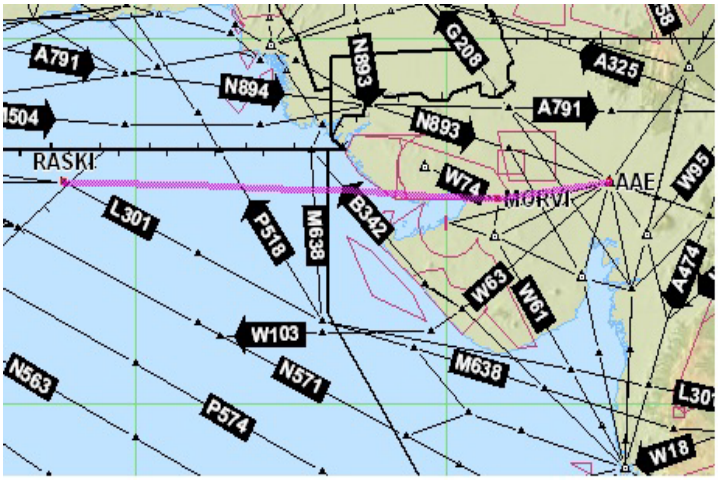
Chapter 1: South Asia

(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

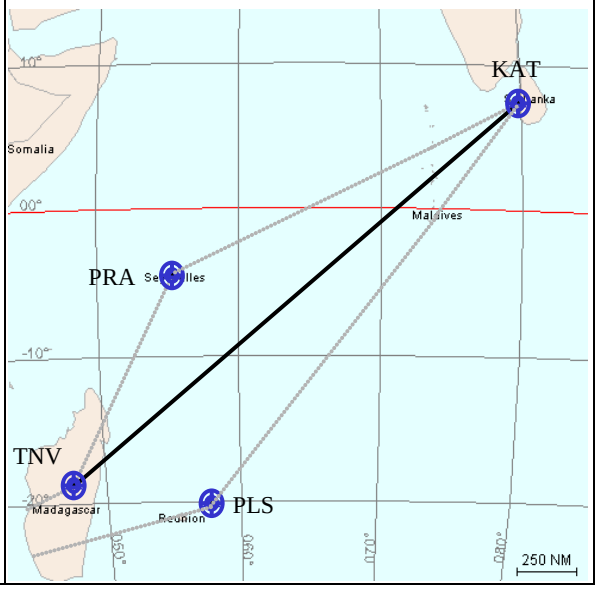
Saving	Per flight	Annual potential
Mileage / Time	80 nm / 9min	
Fuel	765 Kg	8,800 Ton
CO_2	2409 kg	27,700 Ton
No_x		
SO_2		

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

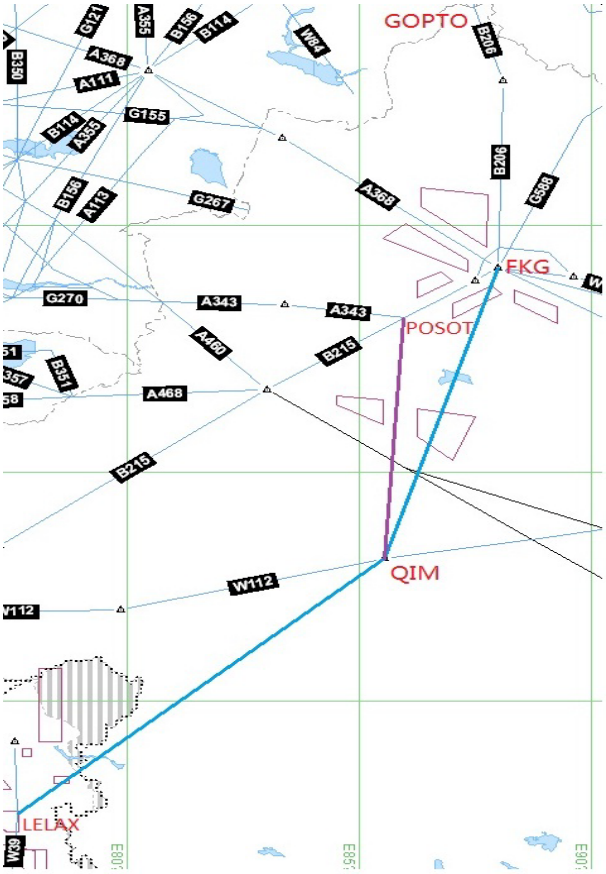
Saving	Per flight	Annual
Mileage / Time	130nm /16 min	
Fuel	2110kg	770,000kg
CO_2	6,500kg	2,370 tonnes
No_x		

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

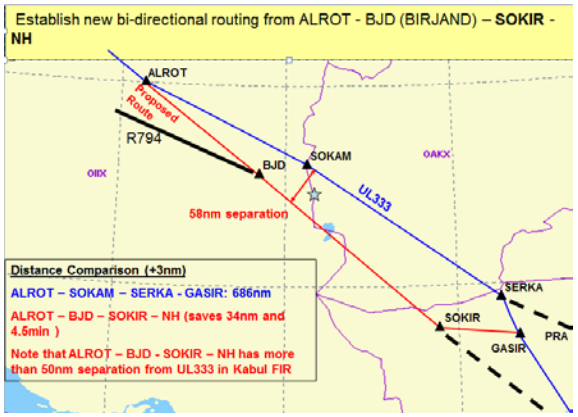
Requested by : Iran

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

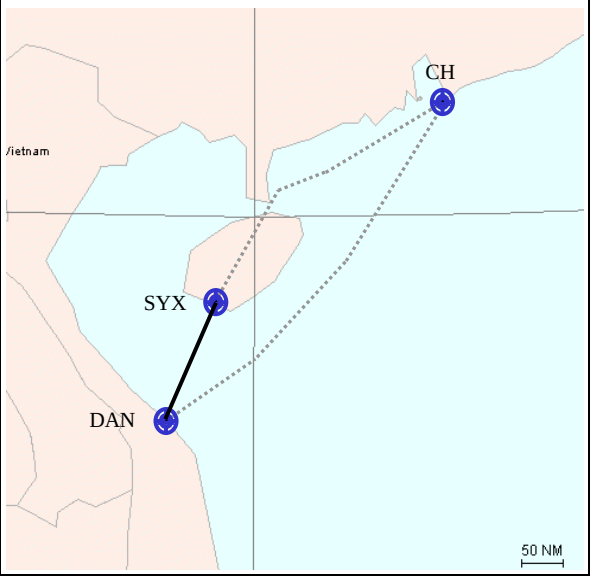
ENTRY/EXIT POINT
DAN / XXXXX / SYX

ROUTE DESCRIPTION
DAN .. SYX

FLIGHT LEVEL BAND
29000 – 46000 feet

PRIORITY: HIGH/MED/LOW

CHART



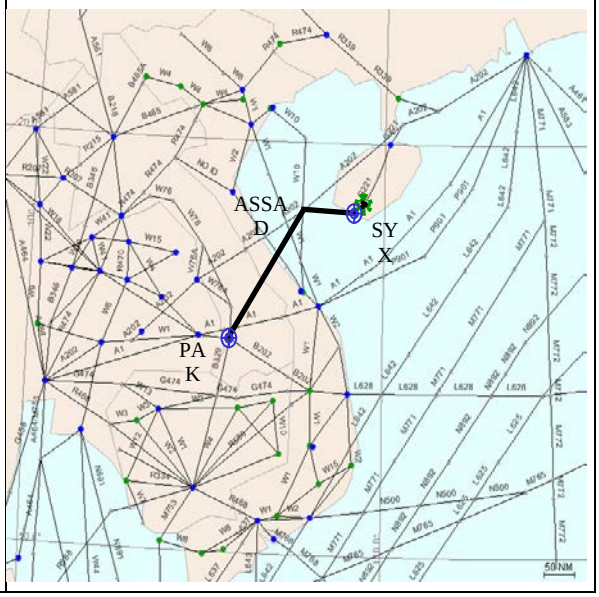
Action Required	IATA
	ICAO

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** 

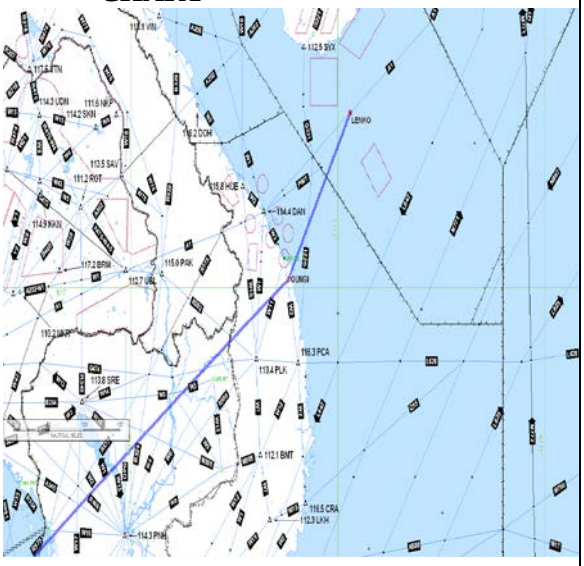
Action Required	IATA
	ICAO

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

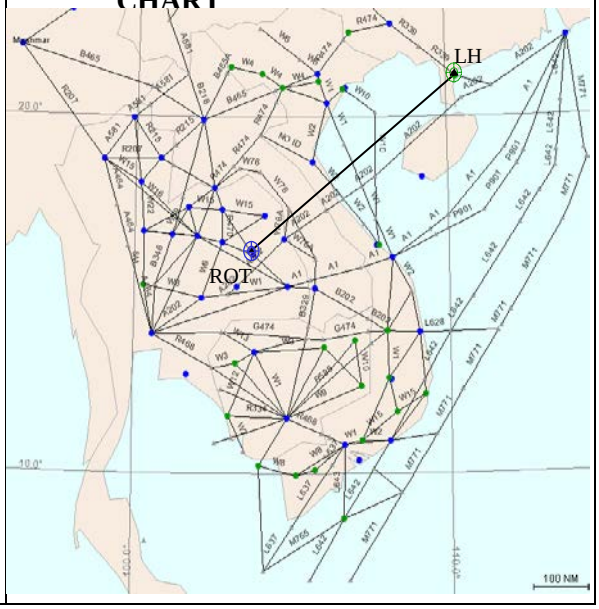
Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

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

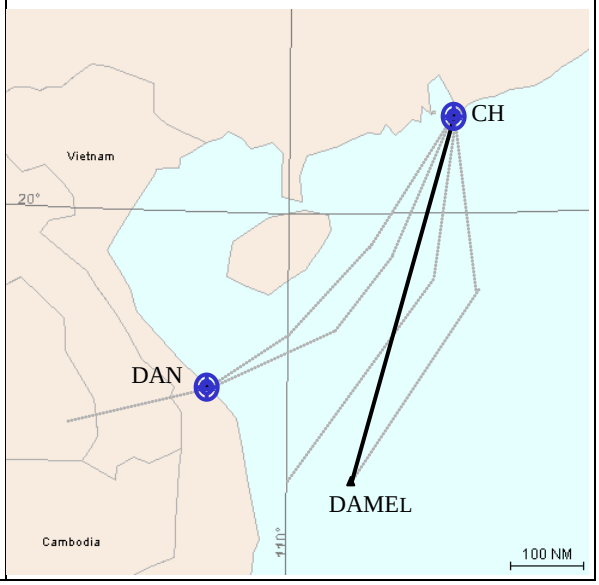
Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

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

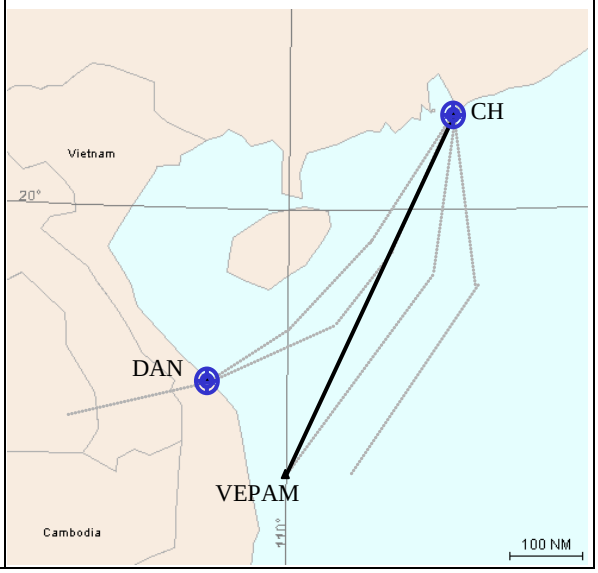
Saving	Per flight	Annual
Mileage / Time	35nm / 4mins	
Fuel	568kg	207594kg
CO_2	1750kg	638,750kg
No_x		

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** 

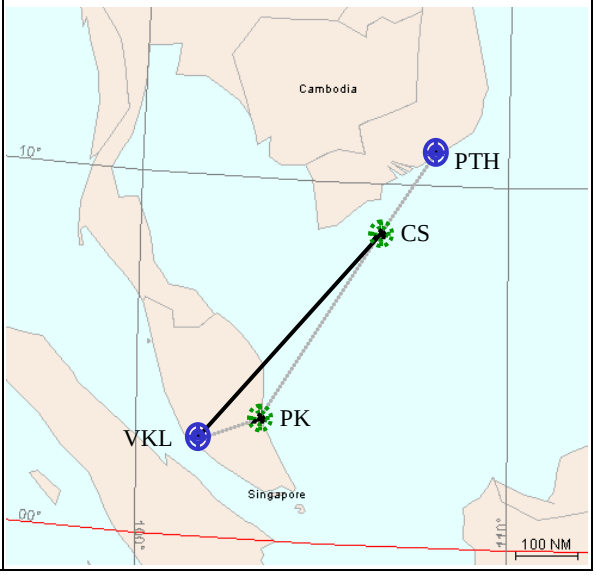
Action Required	IATA
	ICAO

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

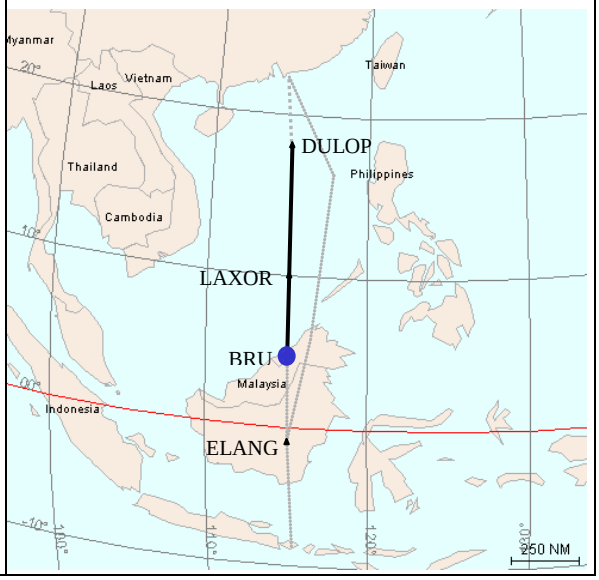
Saving	Per flight	Annual
Mileage / Time	76nm/ 9.5 mins	
Fuel	1235kg	450,775kg
CO_2	3800kg	1,387 tonnes
No_x		

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

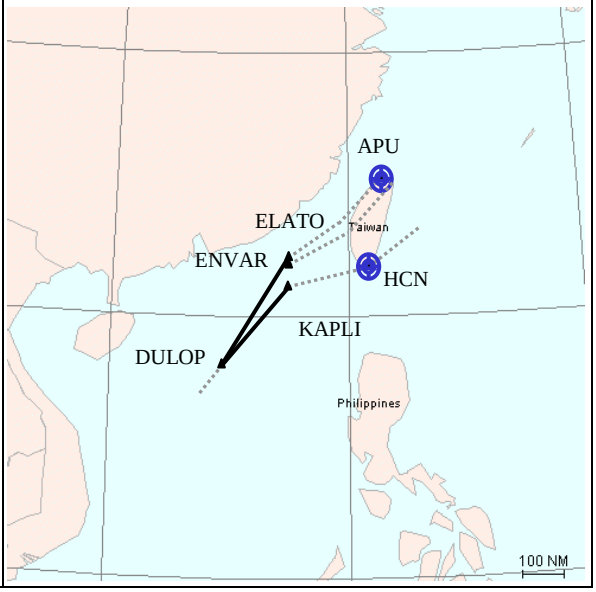
Saving	Per flight	Annual
Mileage / Time	60nm/ 7.5mins	
Fuel	975kg	355,875kg
CO_2	3000kg	1,095 tonnes
No_x		

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**	

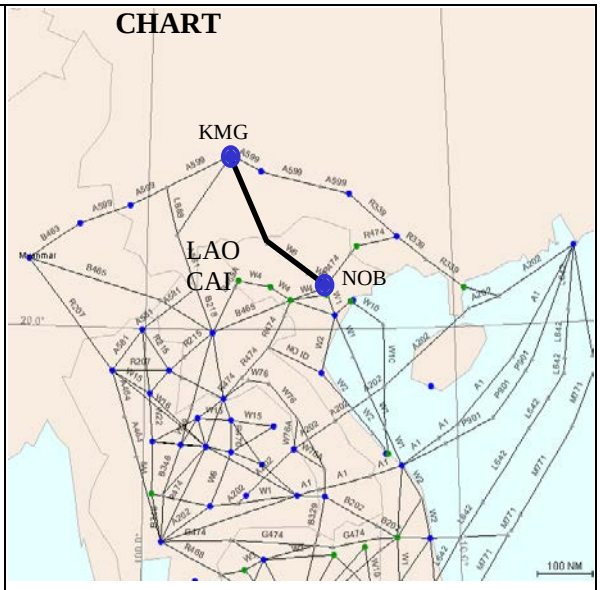
Action Required	IATA
	ICAO

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

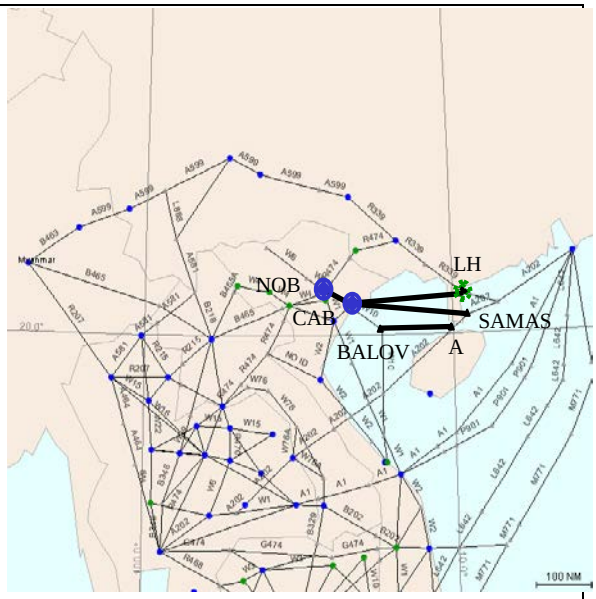
ENTRY/EXIT POINT
XXXXX

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



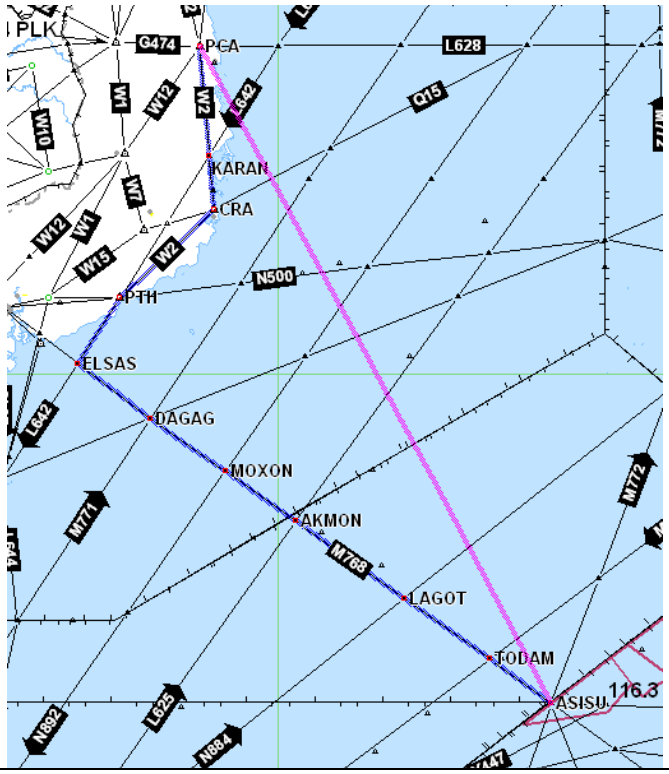
Action Required	States to coordinate to submit proposal for deletion of the requirement.
	ICAO to circulate proposal for deletion from BANP.

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

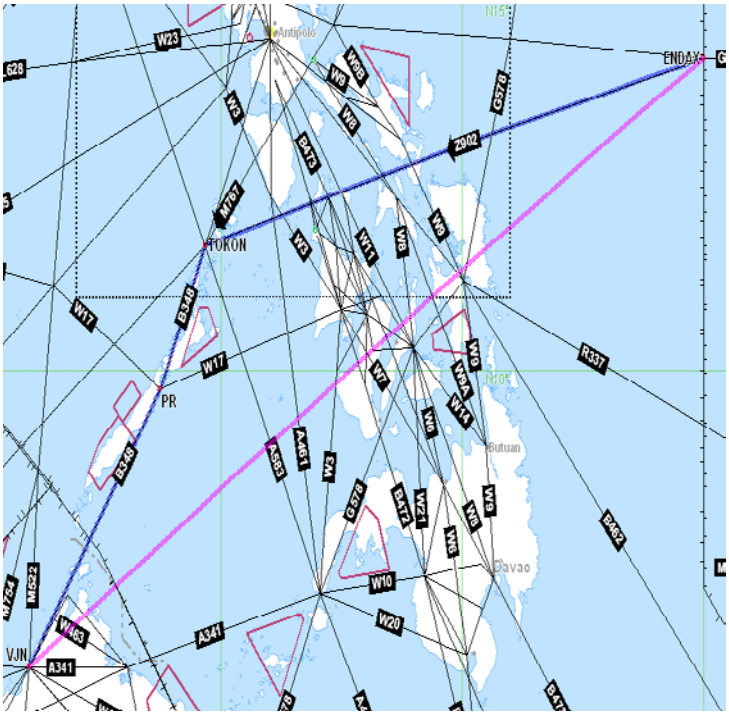
Saving	Per flight	Annual
Mileage / Time	151nm / 22 mins	
Fuel	1827kg	kg
CO_2	5664kg	kg
No_x		

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** 

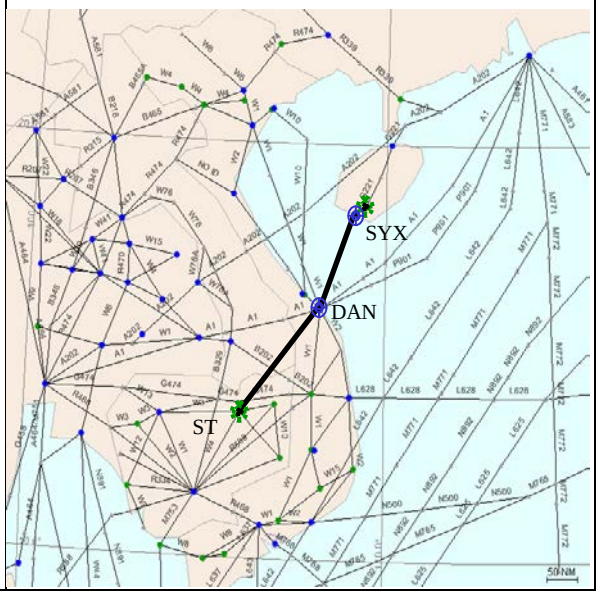
Action Required	IATA
	ICAO

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

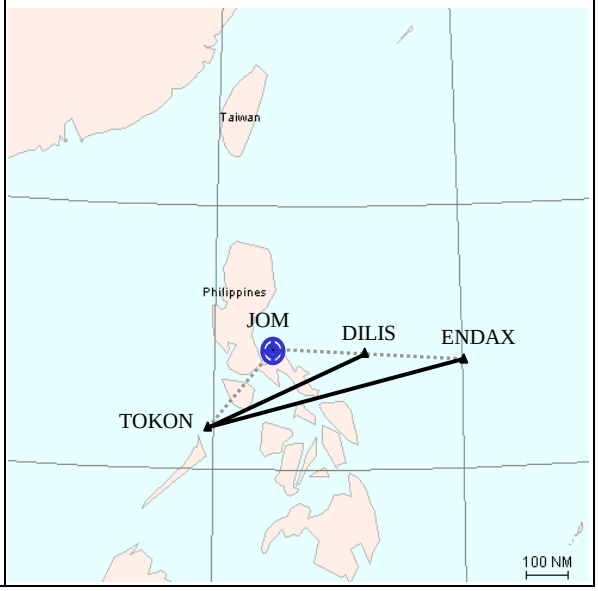
Saving	Per flight	Annual
Mileage / Time	64 nm / 8 min	
Fuel	1040 kg	379,600kg
CO_2	3200 kg	1168 tonnes
No_x		
SO_2		

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	

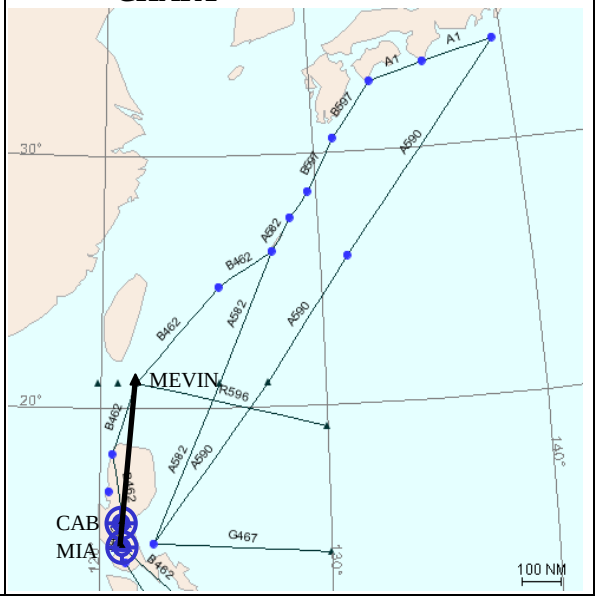
CHA 10 (CHA18)	ARGUK DALIAN HEFEI BEMAG	N4753.0E13439.5 N3857.6 E12130.8 N3146.8 E11718.1 N2601.1 E11400.1	SHENYANG SHENYANG SHANGHAI GUANGZHOU	
CHA 11 (CHA19)	DALIAN XJT	N3857.6 E12130.8 N3557.7 E12014.4	SHENYANG SHANGHAI	
CHA 12	UNWW WXI	N3621.8 E11455.0	SHANGHAI	
IATA2	OMBON RO	N3238.5 E10420.0 N2546.1 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

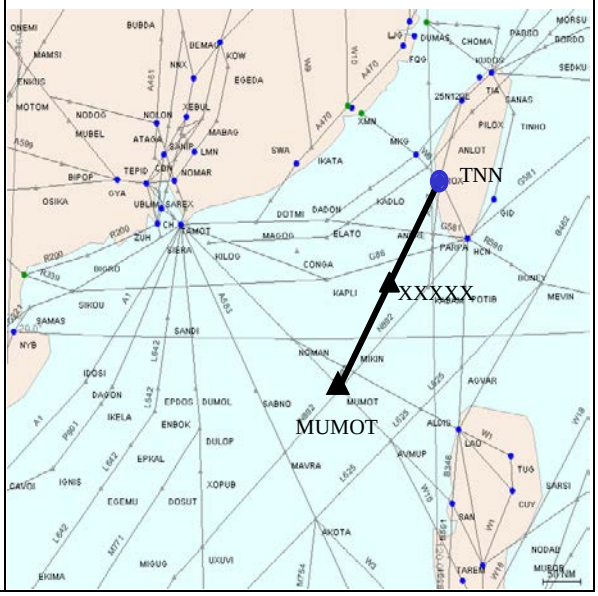
Saving	Per flight	Annual
Mileage / Time	11nm/1.5min	
Fuel	179kg	59,300kg
CO_2	550kg	200,750kg
No_x		

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

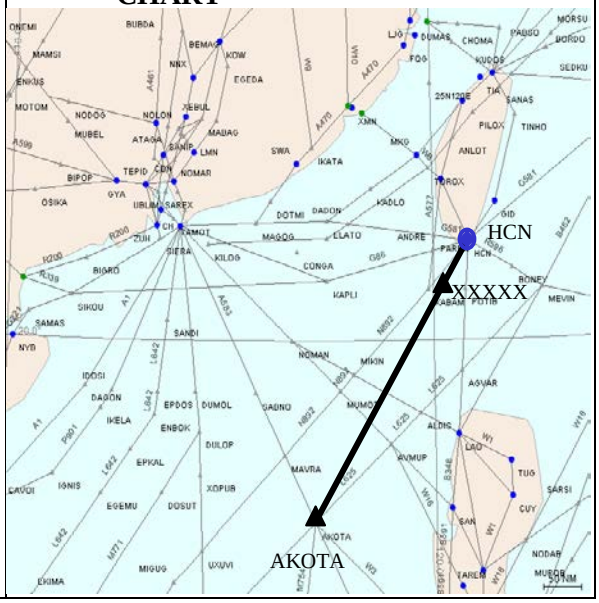
Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

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

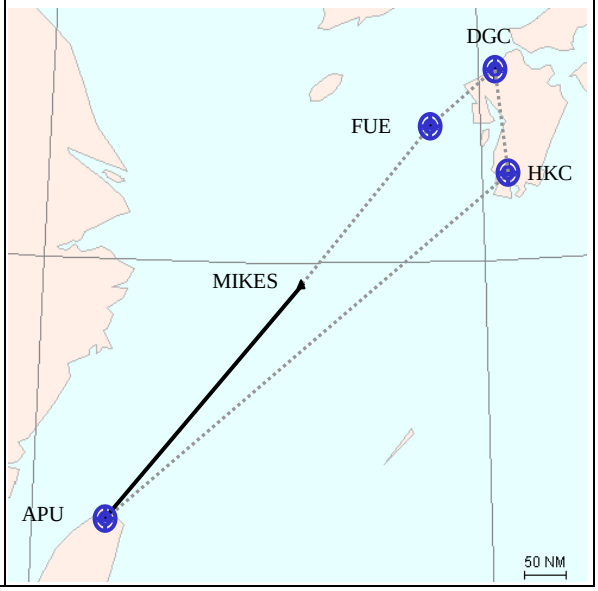
ENTRY/EXIT POINT
APU / XXXXX / MIKES

ROUTE DESCRIPTION
APU- MIKES

FLIGHT LEVEL BAND
28000 – 46000 feet

PRIORITY: HIGH/MED/LOW

CHART



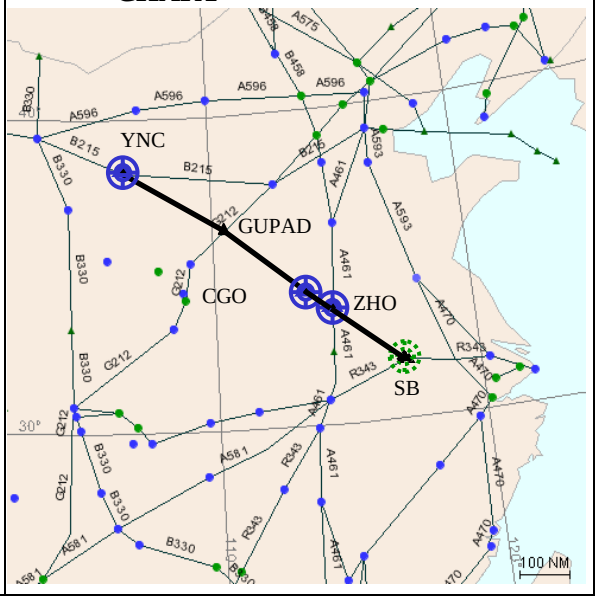
Action Required	IATA
	ICAO

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** 

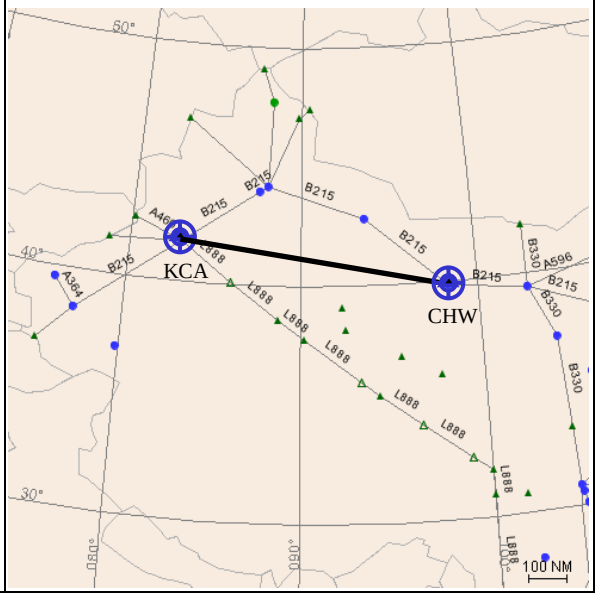
Action Required	IATA
	ICAO

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

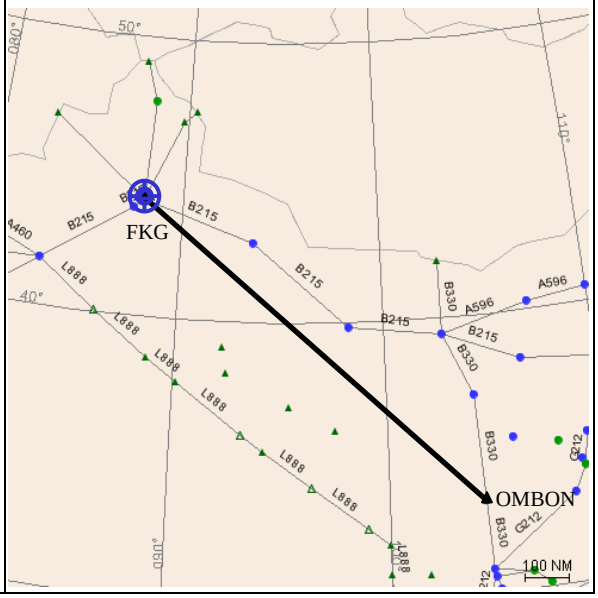
Saving	Per flight	Annual
Mileage / Time	93nm/ 12min	
Fuel		
CO_2		
No_x		

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

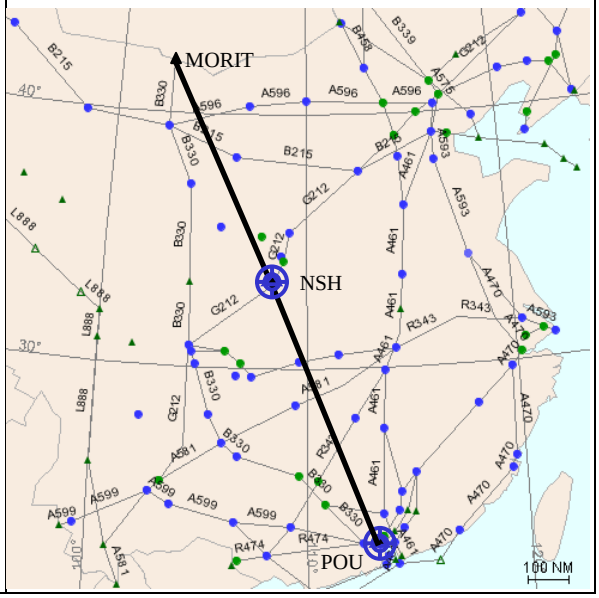
Saving	Per flight	Annual
Mileage / Time	123nm/ 15.5min	
Fuel	2000kg	730,000kg
CO_2	6,150kg	2,245 tonnes
No_x		

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

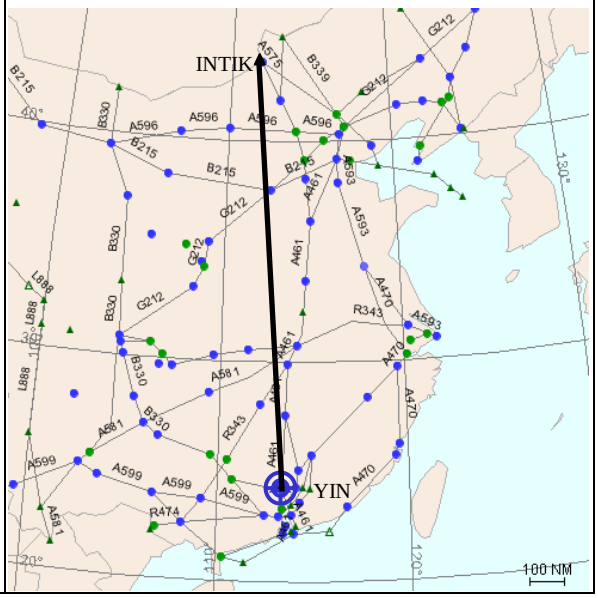
Saving	Per flight	Annual
Mileage / Time	152nm/ 19min	
Fuel	2470kg	901,000kg
CO_2	7,600kg	2,774 tonnes
No_x		

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

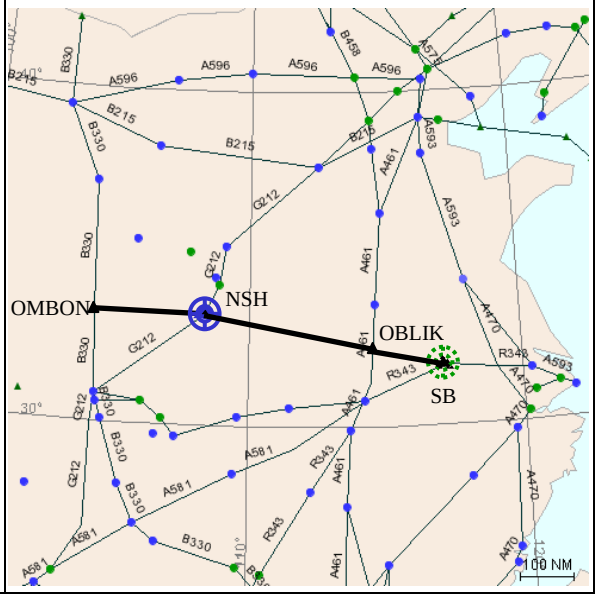
Saving	Per flight	Annual
Mileage / Time	140nm/17.5min	
Fuel	2275kg	830,000kg
CO_2	7,000kg	2,555 tonnes
No_x		

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

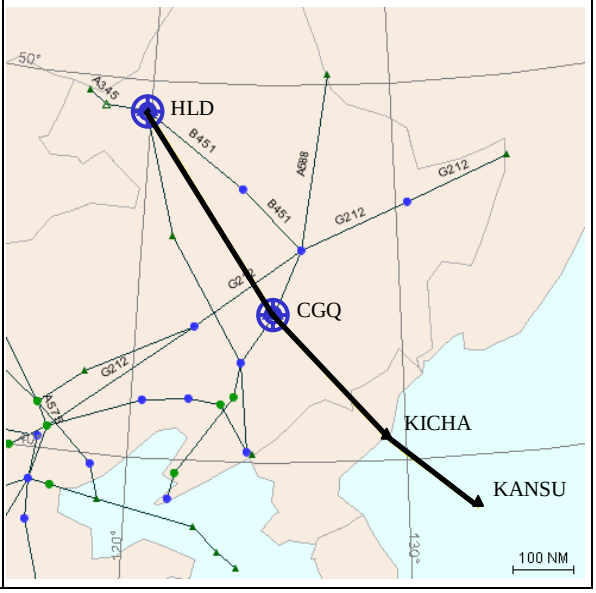
Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

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

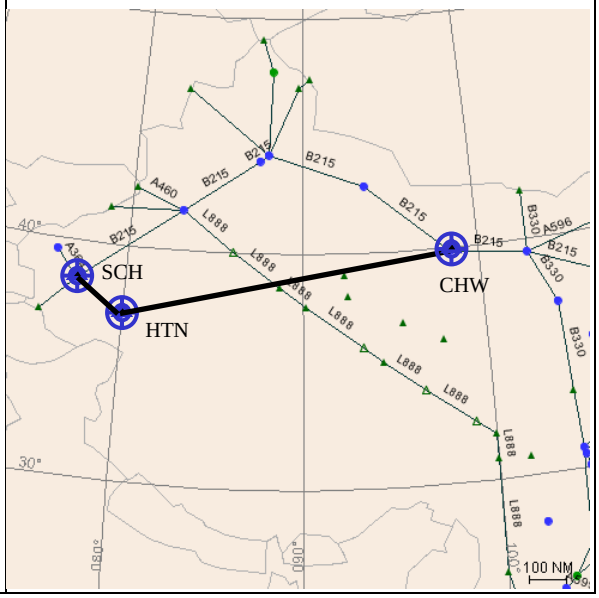
Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

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

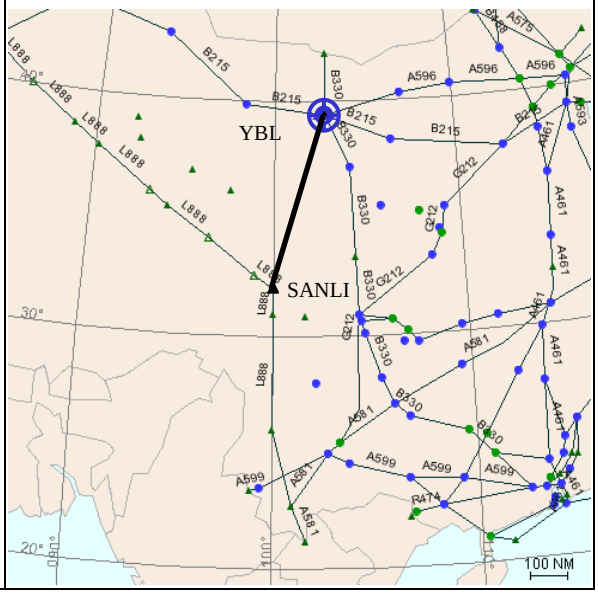
Saving	Per flight	Annual
Mileage / Time	69nm/9min	
Fuel	1121kg	409,000kg
CO_2	3,450 kg	1,260 tonnes
No_x		

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

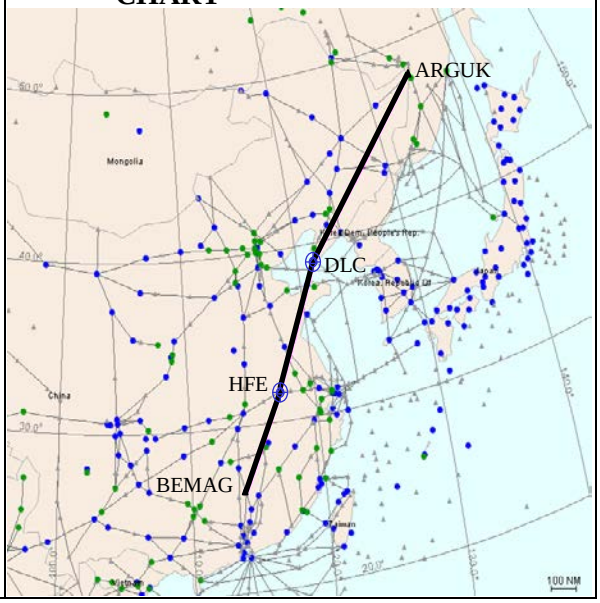
Saving	Per flight	Annual
Mileage / Time	48nm/ 6min	
Fuel	780kg	284,000kg
CO_2	2,400kg	876,000kg
No_x		

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

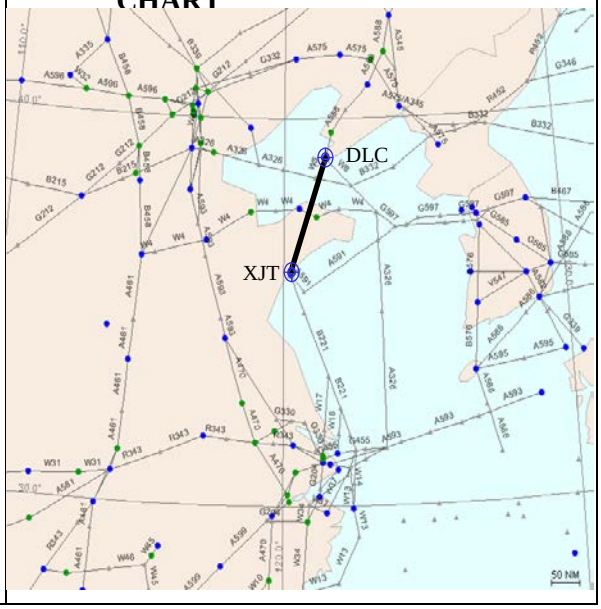
Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

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	

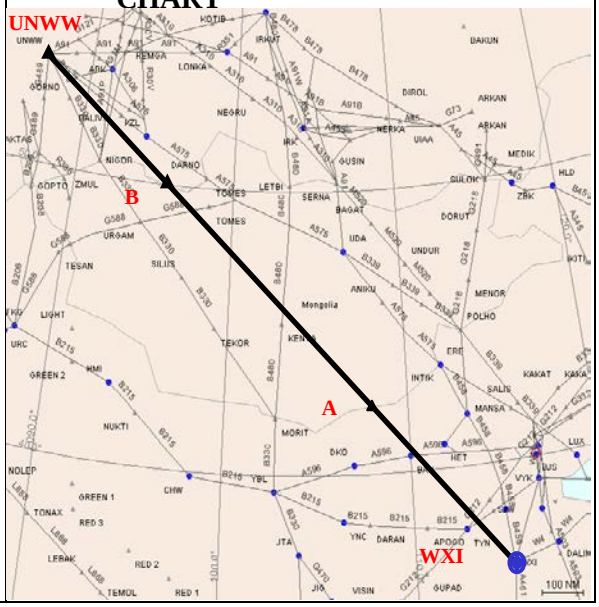
Action Required	IATA
	ICAO

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** 

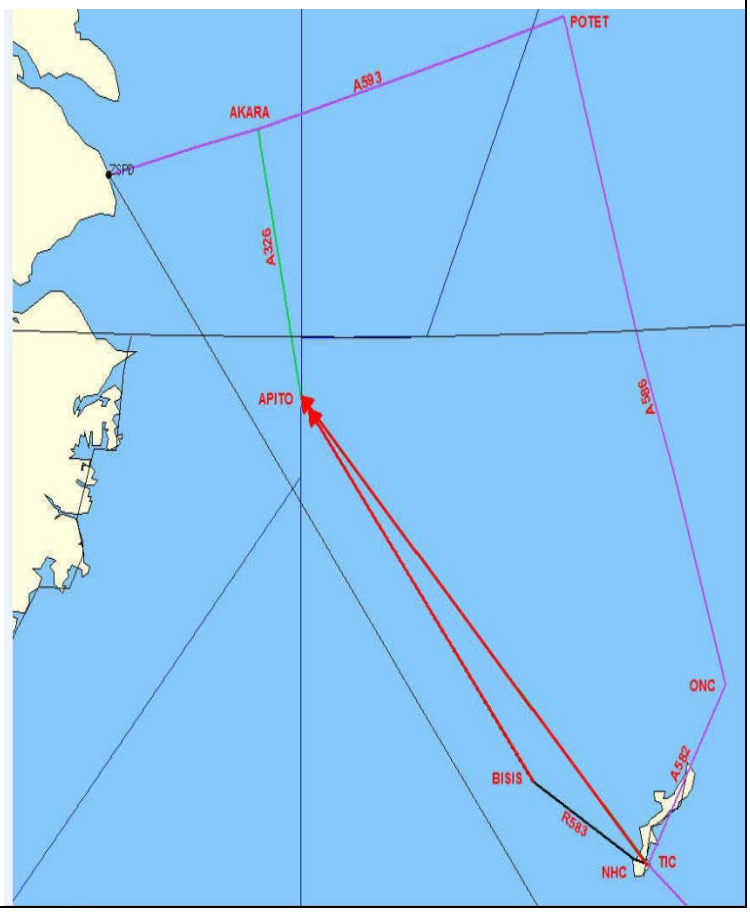
Action Required	IATA
	ICAO

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

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

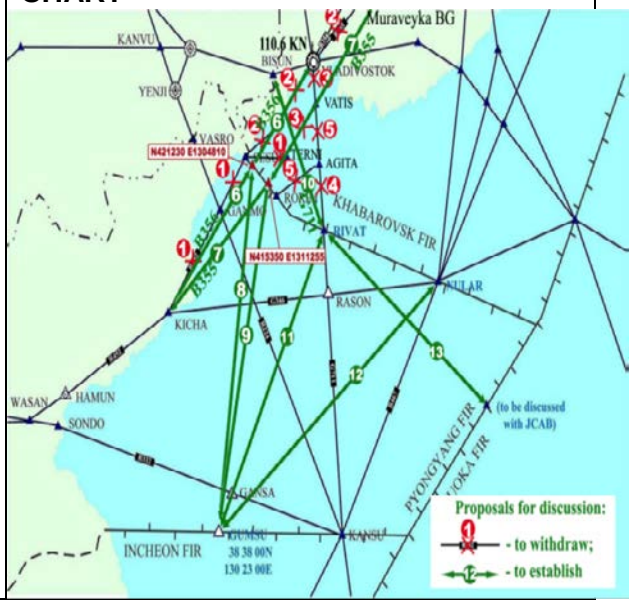
Implementation of bi-directional ATS route
RIVAT (N412900 E1321600) –
GUMSU (N383800 E1302300)

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

ROUTE DESCRIPTION

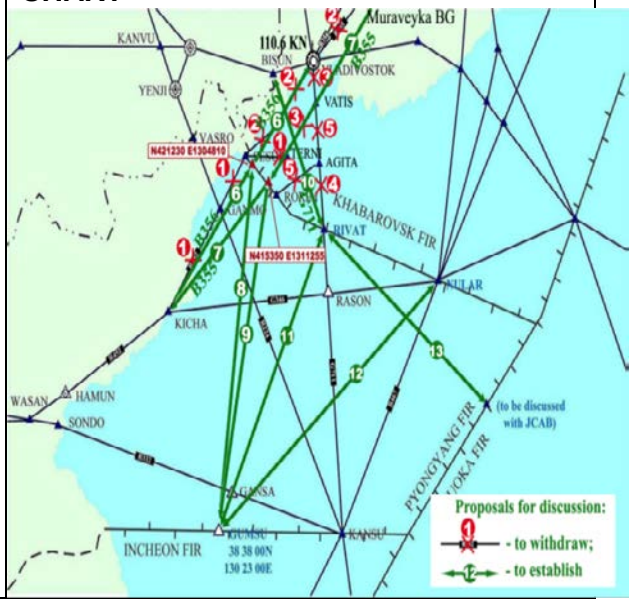
Implementation of bi-directional ATS route **NULAR (N405912 E1341100) – GUMSU (N383800 E1302300)**

FLIGHT LEVEL BAND
28000 – 53000 feet

PRIORITY: HIGH/MED/LOW

PLANNED IMPLEMENTATION DATE
11 December 2014

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. 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

ROUTE DESCRIPTION

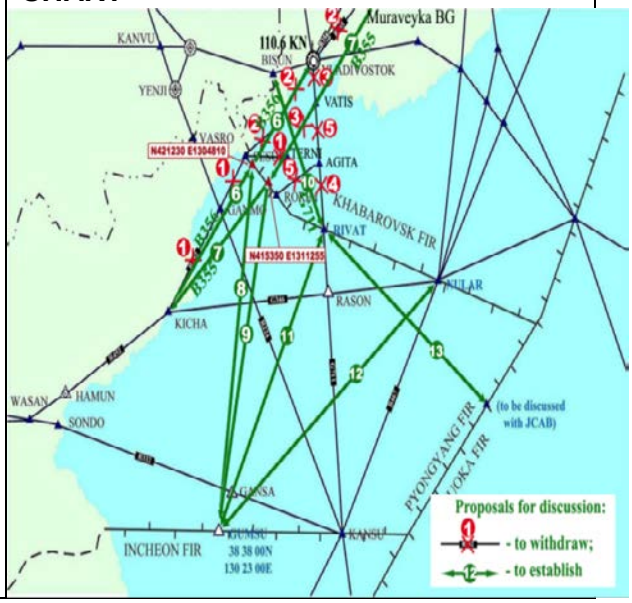
Withdrawal of the ATS route segment
R452:
KICHA (N404103 E1291132) –
SESUR (N421730 E1304130) –
TERNI (N422213 E1314003)

FLIGHT LEVEL BAND

PRIORITY: HIGH/MED/LOW

PLANNED IMPLEMENTATION DATE
As part of project in 2015

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. 1)

Potential City Pairs:

ATS ROUTE NAME: FE0045 / RDGE 20.006

Requested by : PRK / RUS

ENTRY/EXIT POINT

ROUTE DESCRIPTION

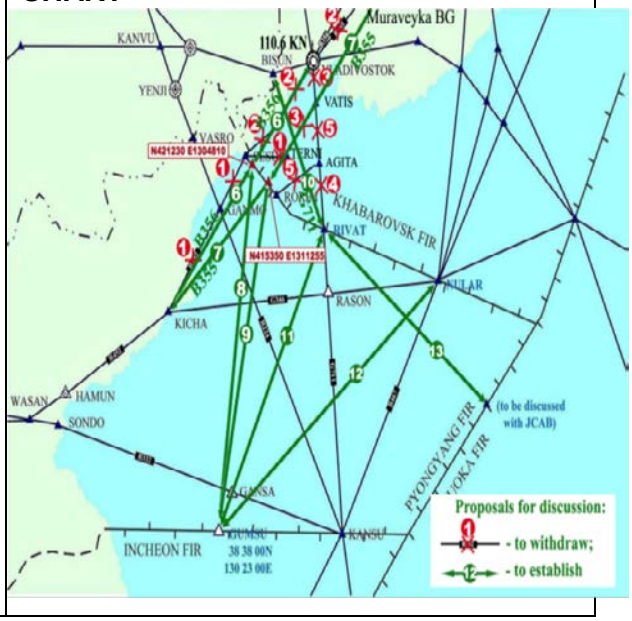
Withdrawal of the ATS route segment
B355:
Muraveyka (BG) (N435303 E1331511) –
DIKUT (N432355 E1320851) –
GAMOV (N423301 E1311303) –
SESUR (N421730 E1304130)

FLIGHT LEVEL BAND

PRIORITY: HIGH/MED/LOW

PLANNED IMPLEMENTATION DATE
As part of project in 2015

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. 2)

Potential City Pairs:

ATS ROUTE NAME: FE0046 / RDGE 20.007

Requested by : PRK / RUS

ENTRY/EXIT POINT

ROUTE DESCRIPTION

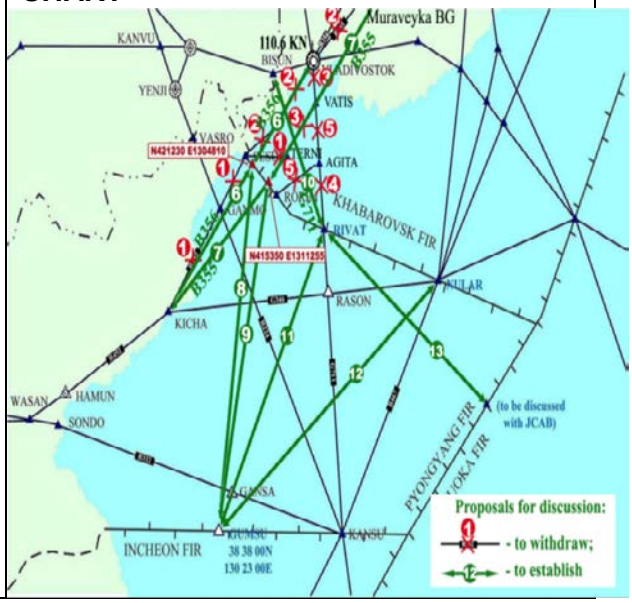
Withdrawal of the ATS route segment
B124:
DIKUT (N432355 E1320851) –
VATIS (N425143 E1320851) –
TERNI (N422213 E1314003)

FLIGHT LEVEL BAND

PRIORITY: HIGH/MED/LOW

PLANNED IMPLEMENTATION DATE
As part of project in 2015

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. 3)

Potential City Pairs:

ATS ROUTE NAME: FE0047 / RDGE 20.008

Requested by : PRK / RUS

ENTRY/EXIT POINT

ROUTE DESCRIPTION

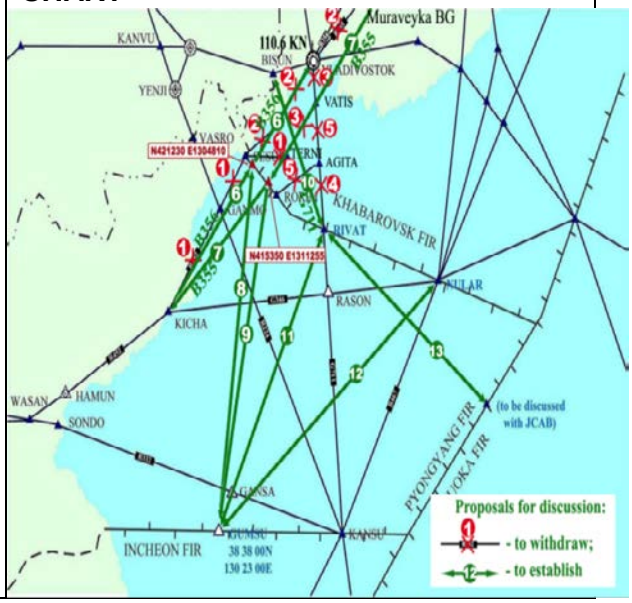
Withdrawal of the ATS route segment
G711:
AGITA (N421937 E1321151) –
RIVAT (N412900 E1321600)

FLIGHT LEVEL BAND

PRIORITY: HIGH/MED/LOW

PLANNED IMPLEMENTATION DATE
As part of project in 2015

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. 4)

Potential City Pairs:

ATS ROUTE NAME: FE0048 / RDGE 20.009

Requested by : PRK / RUS

ENTRY/EXIT POINT

ROUTE DESCRIPTION

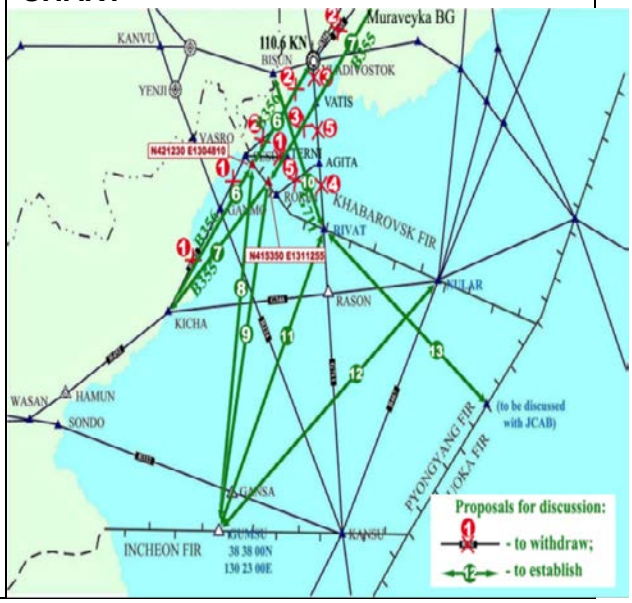
Withdrawal of the ATS route segment
G721:
VATIS (N425143 E1320851) –
AGITA (N421937 E1321151) –
RORIM (N415031 E1311639)

FLIGHT LEVEL BAND

PRIORITY: HIGH/MED/LOW

PLANNED IMPLEMENTATION DATE
As part of project in 2015

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. 5)

Potential City Pairs:

ATS ROUTE NAME: FE0049 / RDGE 20.010

Requested by : PRK / RUS

ENTRY/EXIT POINT

ROUTE DESCRIPTION

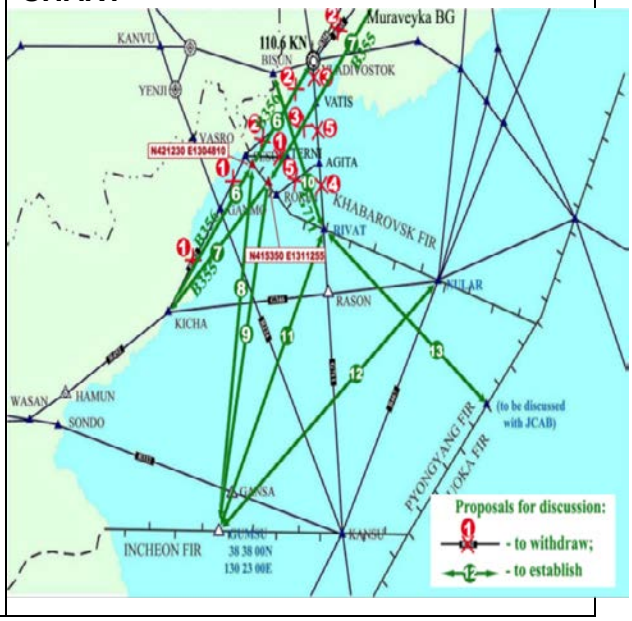
Implementation of uni-directional eastbound ATS route segment **B356**:
KICHA (N404103 E1291140) –
new waypoint (N421230 E1304810) –
110.6 KN Vladivostok (N432303 E1320708)

FLIGHT LEVEL BAND
17000 – 53000 feet

PRIORITY: HIGH/MED/LOW

PLANNED IMPLEMENTATION DATE
As part of project in 2015

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. 6)

Potential City Pairs:

ATS ROUTE NAME: FE0050 / RDGE 20.011

Requested by : PRK / RUS

ENTRY/EXIT POINT

ROUTE DESCRIPTION

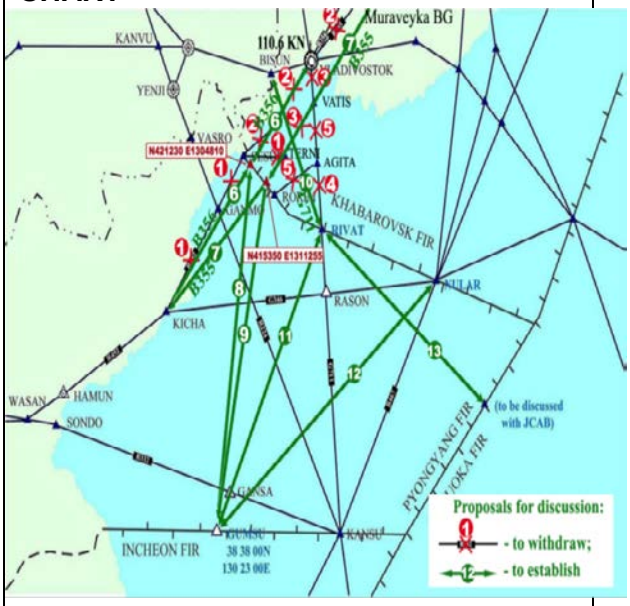
Implementation of uni-directional westbound ATS route segment **B355**:
Muraveyka (BG) (N435303 E1331511) – VATIS (N425143 E1320851) – TERNI (N422213 E1314003) – new waypoint (N415350 E1311255) – KICHA (N404106 E1291140)

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

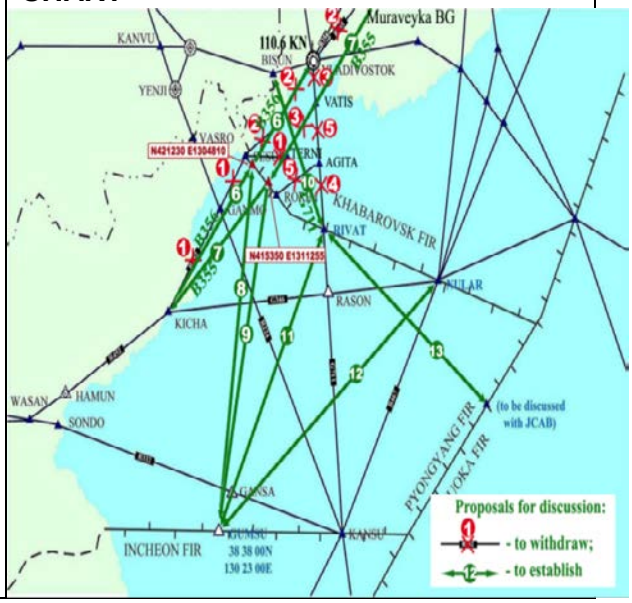
Implementation of new uni-directional eastbound ATS route segment:
GUMSU (N383800 E1302300) – new waypoint (N421230 E1304810)

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

ROUTE DESCRIPTION

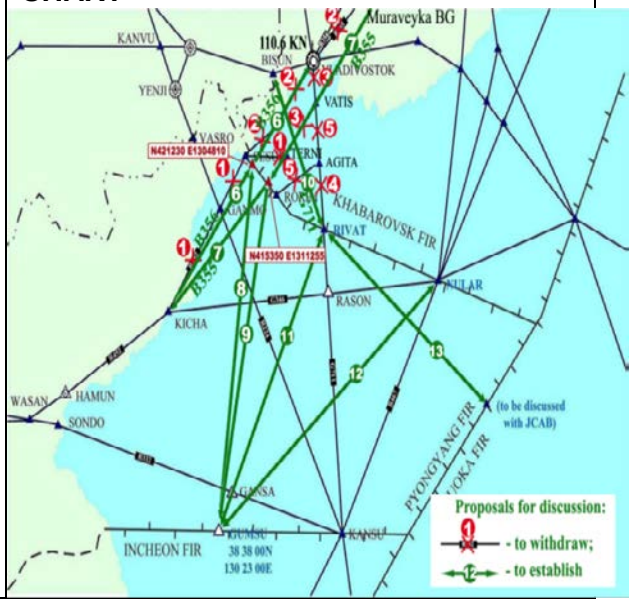
Implementation of new uni-directional westbound ATS route segment:
new waypoint (N415350 E1311255) – GUMSU (N383800 E1302300)

FLIGHT LEVEL BAND
28000 – 51000 feet

PRIORITY: HIGH/MED/LOW

PLANNED IMPLEMENTATION DATE
As part of project in 2015

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. 9)

Potential City Pairs:

ATS ROUTE NAME: FE0053 / RDGE 20.014

Requested by : PRK / RUS

ENTRY/EXIT POINT

ROUTE DESCRIPTION

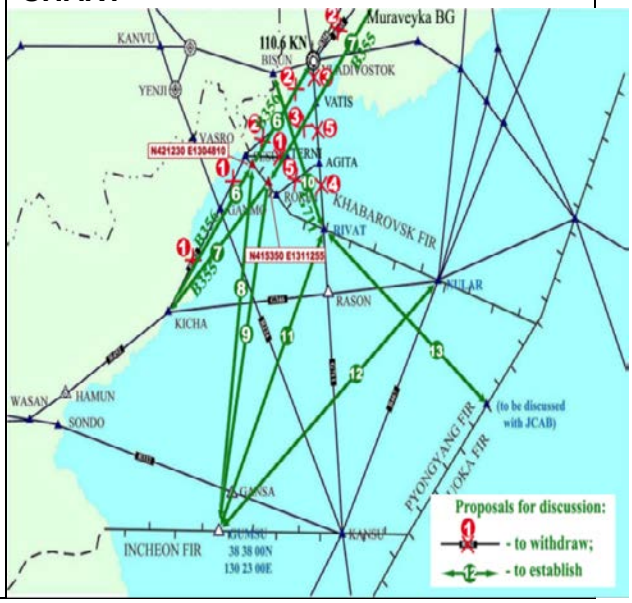
Implementation of bi-directional ATS route segment **G711:**
BISUN (N431400 E1311148) –
TERNI (N422213 E1314003) –
RIVAT (N412900 E1321600)

FLIGHT LEVEL BAND
21000 – 53000 feet

PRIORITY: HIGH/MED/LOW

PLANNED IMPLEMENTATION DATE
As part of project in 2015

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. 10)

Potential City Pairs:

ATS ROUTE NAME: FE0056 / RDGE 20.017

Requested by : PRK / RUS

ENTRY/EXIT POINT

ROUTE DESCRIPTION

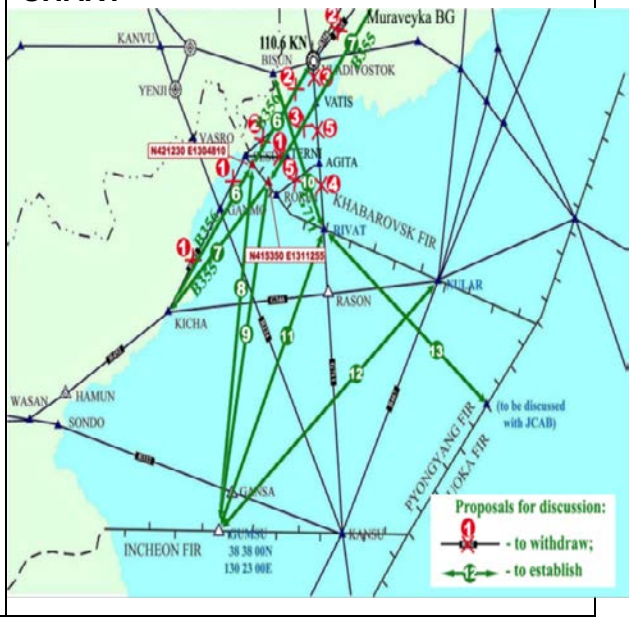
Implementation of new bi-directional ATS route segment:
RIVAT (N412900 E1321600) –
to new waypoint on FIR border (NXXXXXX EXXXXXXX) between Pyongyang FIR and Fukuoka FIR

FLIGHT LEVEL BAND

PRIORITY: HIGH/MED/LOW

PLANNED IMPLEMENTATION DATE
As part of project in 2015

CHART



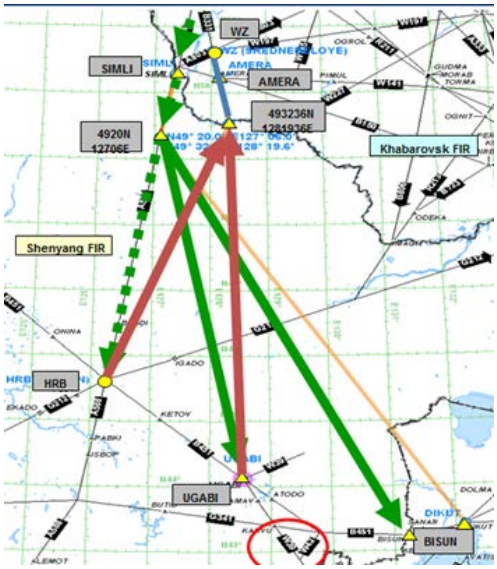
Action Required	IATA
	ICAO Coordination DPRK, Japan, Russian Federation

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

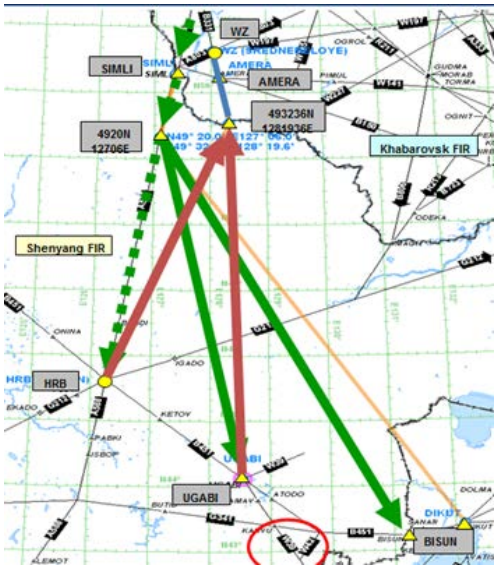
Implementation of new bi-directional ATS route segment:
new waypoint 493236N 1281936E –
AMERA –
WZ (Srednebeloye)

FLIGHT LEVEL BAND

PRIORITY: HIGH/MED/LOW

PLANNED IMPLEMENTATION DATE

CHART



Action Required	IATA
	ICAO Coordination Russian Federation, China

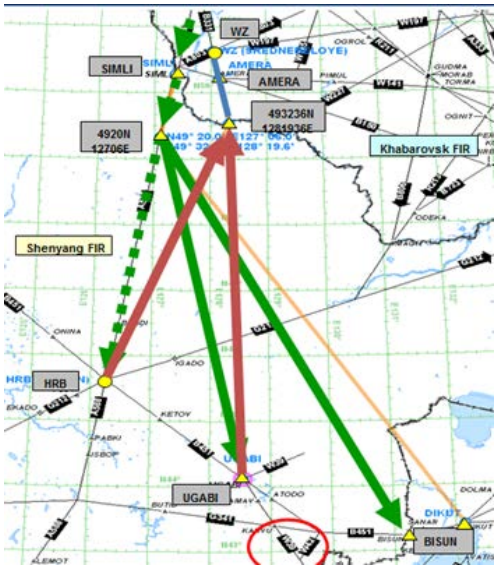
Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

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** 

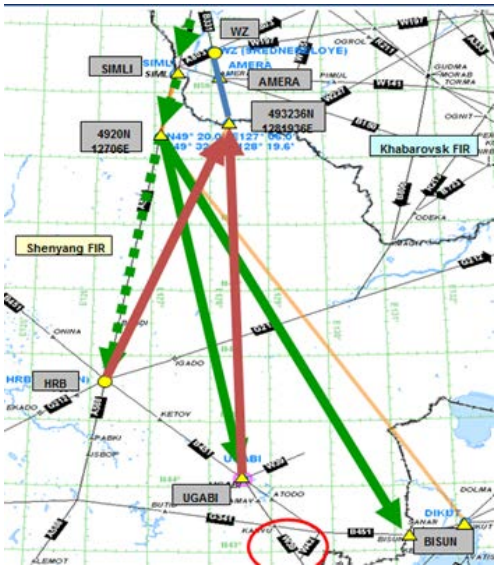
Action Required	IATA
	ICAO Coordination Russian Federation, China

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

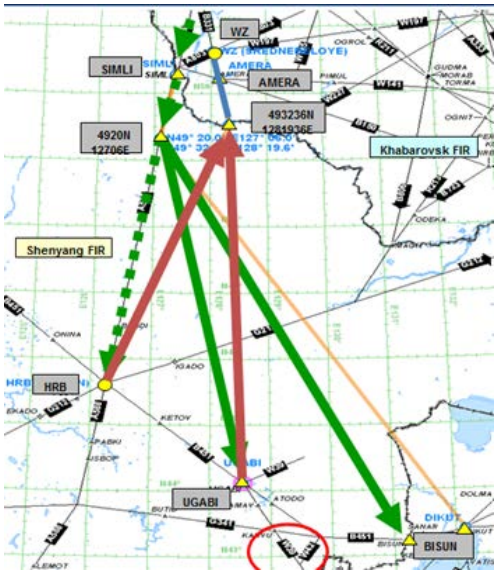
Saving	Per flight	Annual
Mileage / Time		
Fuel		
CO_2		
No_x		

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

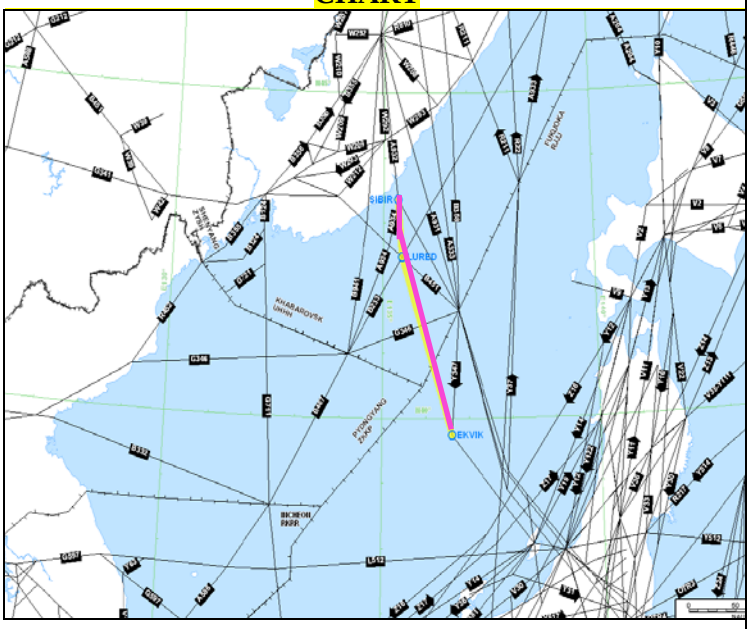
Action Required	IATA
	ICAO

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** 

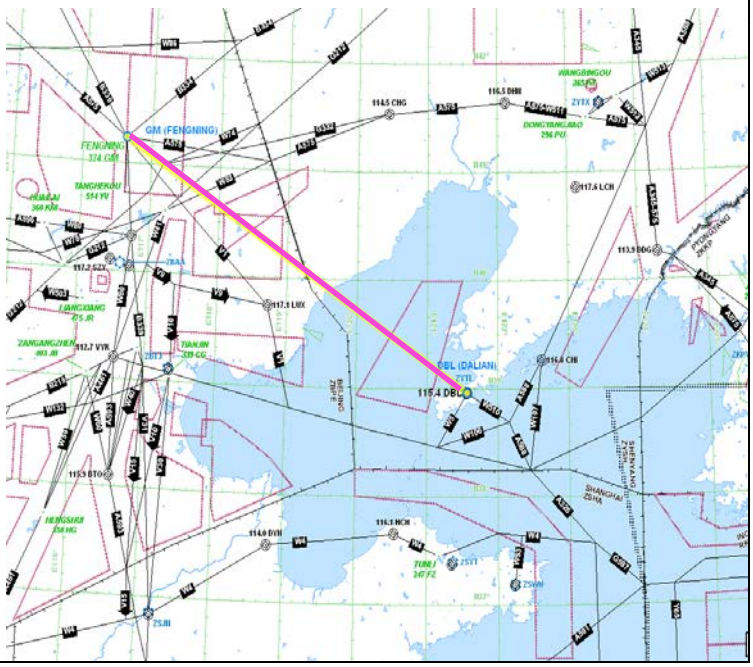
Action Required	IATA
	ICAO

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** 

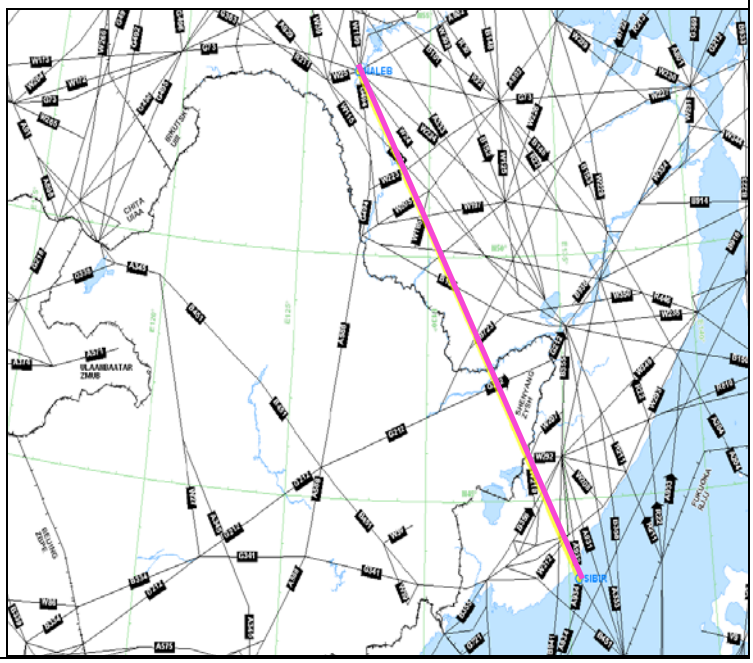
Action Required	IATA
	ICAO

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

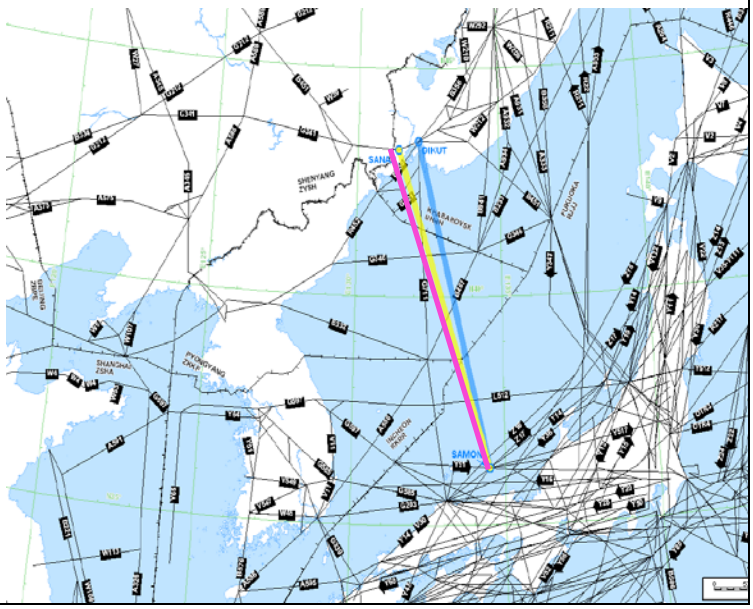
ENTRY/EXIT POINT	**CHART**
ROUTE DESCRIPTION **FLIGHT LEVEL BAND** **NALEB - SIBIR.** **PRIORITY:** **States concerned** CHINA RUSSIAN FEDERATION	

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

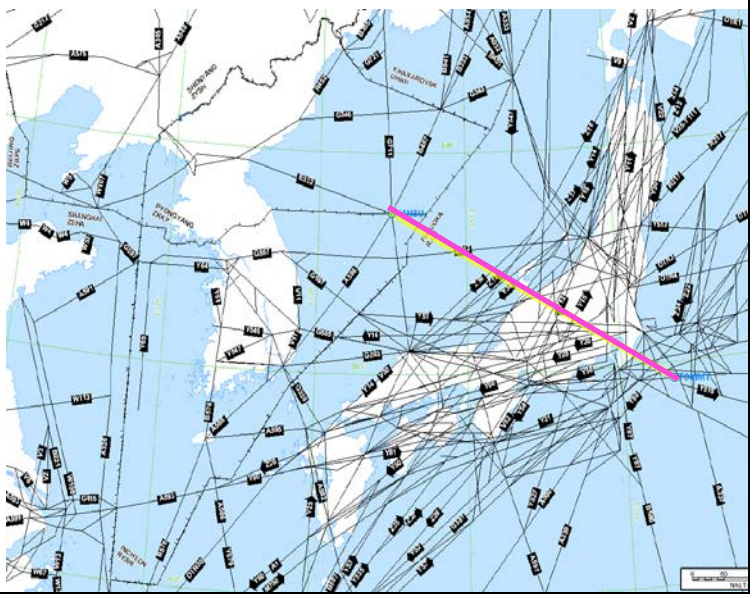
Action Required	IATA
	ICAO

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

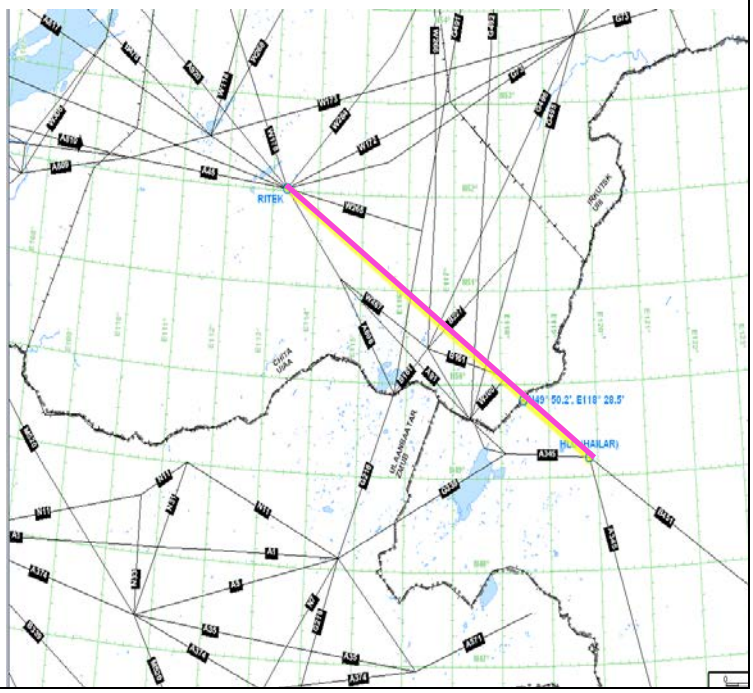
Action Required	IATA
	ICAO

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	

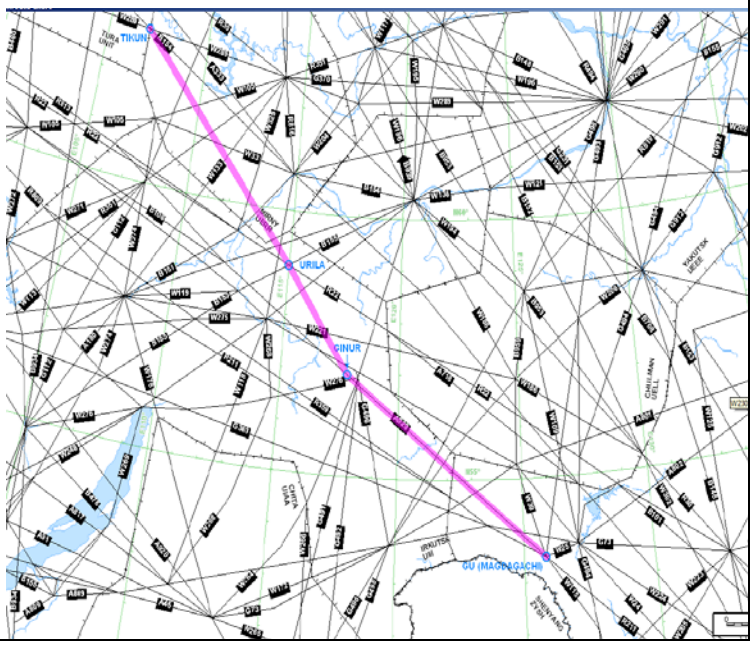
Action Required	IATA
	ICAO

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

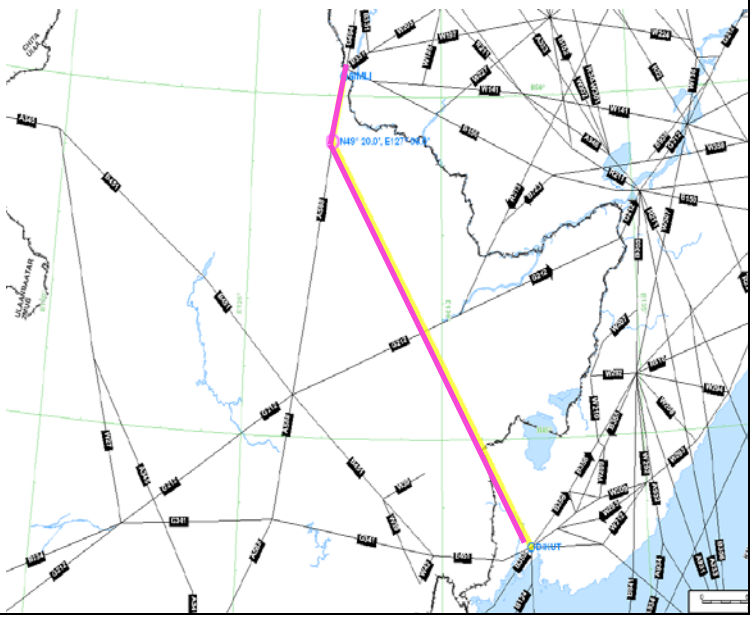
Action Required	IATA
	ICAO

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

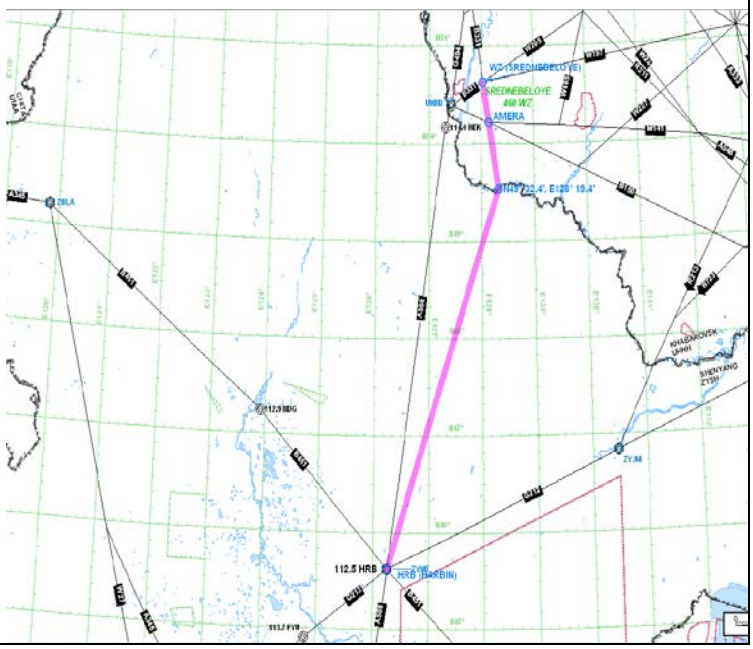
ENTRY/EXIT POINT	**CHART**
ROUTE DESCRIPTION **SIMLI - new waypoint 492000N 1270600E - DIKUT**. **FLIGHT LEVEL BAND** **PRIORITY:** **States concerned** CHINA RUSSIAN FEDERATION	

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	**CHART**
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	

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

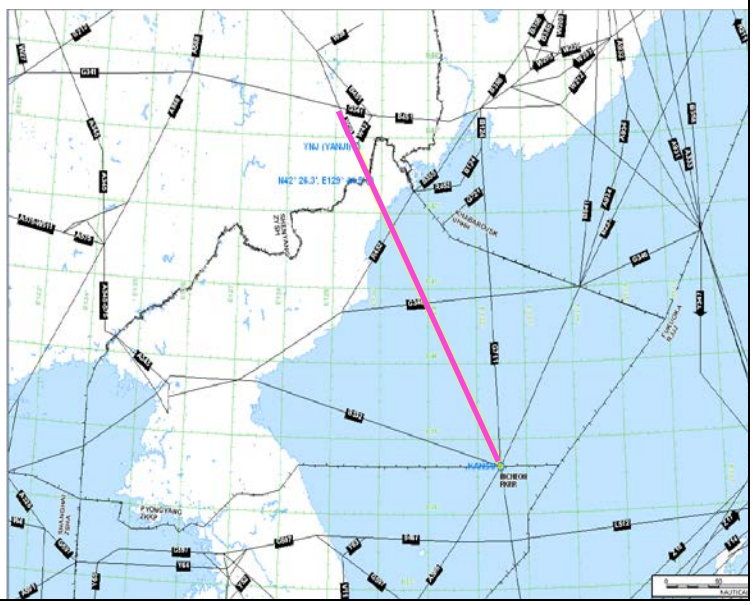
ENTRY/EXIT POINT	**CHART**
ROUTE DESCRIPTION unidirectional Eastbound route **SIMLI - HEK - 492000N 12706E - LEPNI - 422624.7N 1294454.7E - KANSU** **FLIGHT LEVEL BAND** **PRIORITY:** **States concerned** CHINA DEM. PEOPLE'S REP. OF KOREA RUSSIAN FEDERATION	

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** 

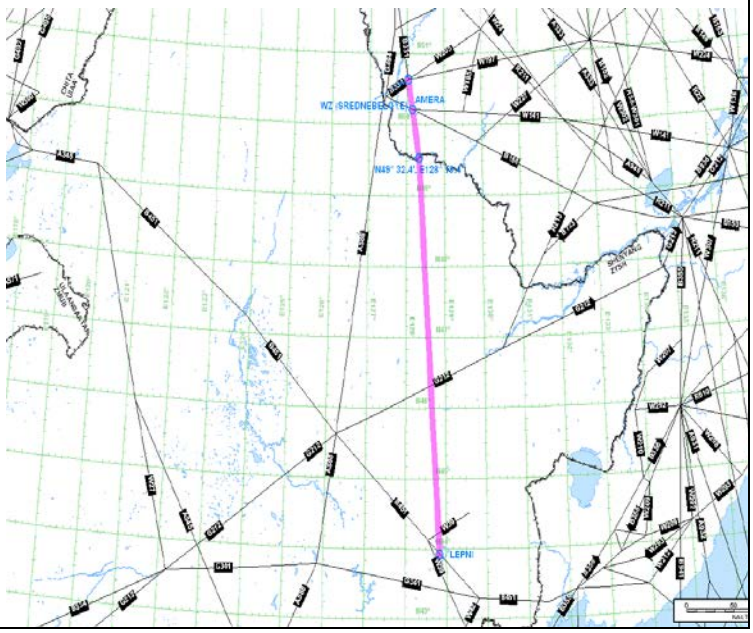
Action Required	IATA
	ICAO

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