INTERNATIONAL CIVIL AVIATION ORGANIZATION
ASIA AND PACIFIC OFFICE

SUMMARY OF DISCUSSION
SPECIAL ATS COORDINATION MEETING
CROSS-POLAR AND RUSSIAN TRANS-EAST ATS ROUTES
(SCM POLAR & RTE)

BANGKOK, THAILAND

15 & 16 NOVEMBER 2005

The views expressed in this Report should be taken as those of the Meeting and not the Organization

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1.1 Introduction

1.1.1 The Special ATS Coordination Meeting Cross-Polar and Russian Trans-East ATS Routes (SCM POLAR & RTE) was held at the ICAO Asia and Pacific Regional Office, Bangkok, Thailand on 15 and 16 November 2005 to review the present operational and technical aspects related to the increase in traffic on the cross-Polar and Russian Trans-East routes.

1.2 Officers, Secretariat and Participants

1.2.1 The meeting was opened by Mr. Andrew Tiede, Regional Officer ATM, on behalf of Mr. L. B. Shah, ICAO Asia Pacific Regional Director.

1.2.2 Mr. Tiede acted as the Secretary of the meeting. He was assisted by Mr. Kyotaro Harano, Regional Officer ATM.

1.2.3 Thirty-four (34) participants from China, Mongolia, Russian Federation, United States and IATA attended the meeting. A list of participants together with their designations and contact details is in **Appendix A** to this Report.

1.2.4 The meeting was conducted in English, with Russian translation provided by the Russian Federation. All meeting papers and the meeting report were in English a list of the meeting papers is at **Appendix B**. The meeting noted the overlapping use of the terminologies "Russian Far-East" and "Russian Trans-East" and, as Russian Trans-East had been previously adopted by ICAO, agreed that this term would be used throughout the meeting.

1.3 Background

1.3.1 In opening the meeting, Mr. Tiede drew attention to the escalating traffic demands for cross-Polar ATS routes and the additional city pair services that are evolving between Asia and North America. Issues in this respect were normally considered under the auspices of the China, Mongolia, Russian Federation and IATA ATS Coordination Group (CMRI) and the informal Russian American Coordinating Group for Air Traffic Control (RACGAT). However, as the most recent meeting of the CMRI (CMRI/4) was held in Shenzen, China in March 2003 and the last RACGAT meeting (RACGAT/13) was held in Vladivostok, Russia in October 2003, of concern for the Asia Region has been the lack of multi-lateral airspace planning opportunities in recent years.

1.3.2 This situation had resulted in the Russian Federation and IATA requesting urgent assistance from the Regional Office by facilitating a Special ATS Coordination Meeting in order to consider developments in this area. In particular, the meeting would review present operational and technical aspects related to the increase in traffic on the cross-Polar and Russian Trans-East routes, as well as the future operational and technical requirements for traffic flows between North America and Asia in order to meet forecast traffic growth.

1.3.3 Mr. Tiede was pleased to note the presence of delegations from China, Mongolia, the Russian Federation and IATA, which enabled the meeting to be considered as a 'mini CMRI', at least in purpose if not in name, albeit limited to the restricted agenda that was proposed for the meeting. Nevertheless, Mr. Tiede urged delegates to take advantage of the presence of the CMRI partners and the United States and hold side meetings and discussions in respect of other relevant issues.

1.3.4 IATA thanked the Regional Office for the assistance in facilitating the meeting. The representative of IATA observed that almost twenty representatives from airlines were attending the meeting, which indicated the immense interest by the airlines in the cross-Polar and trans-East routes. IATA stressed that the implementation of new routes and improvement to ATS operations were long

overdue, particularly with the current rise in fuel costs, and urged the identification and early implementation by the States at the meeting of as many initiatives as possible.

1.3.5 The Russia Federation thanked the Regional Office for the initiative to hold the meeting. As fuel savings largely depended on the ATC system, streamlining of the ATS routes were very important to airlines. The Russia Federation had seen a tremendous traffic growth in the cross-Polar routes in nine month so far in 2005, and stressed that cooperation of the States concerned was very important to cope with the traffic increase.

1.3.6 The Russian Federation briefed the meeting on changes that had been announced by President Putin during September 2005. A Federal Air Navigation Authority would be established that was expected to be fully functional by early 2006. Of particular relevance to this meeting was that the new authority would take responsibility for the regulation of airspace usage, a function previously held by the Ministry of Defence, and would take overall responsibility for over flight issues. A three month transition period had been planned and it was anticipated that further information regarding the roles, functions and processes of the new authority would become available early in the New Year.

1.3.7 Mongolia thanked the Regional Office for the meeting preparations, and expressed that it would be a good opportunity and a suitable forum to discuss the route arrangements with the States concerned.

1.3.8 China also thanked the Regional Office for the meeting arrangements. The representative said the meeting would be the best opportunity to learn what the airlines' requirements were with regard to the cross-Polar routes.

1.3.9 The United States, in noting the end-to-end representation from Asia to the United States that was participating at the meeting, also took the opportunity to thank the Regional Office for preparing and hosting the meeting, and wished the meeting every success.

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Agenda Item 1: Adoption of Agenda

1.1 The meeting adopted the following agenda:

Agenda Item 1:	Adoption of Agenda
Agenda item 2:	Operations Asia/North America via Cross-Polar/ Russian Trans-East routes
Agenda Item 3:	Cross-Polar/Russian Trans-East ATS route review – Asia/North America traffic flows
Agenda Item 4:	Any other business

Agenda Item 2: Operations Asia/North America via Cross-Polar/Russian Trans-East routes

Review of CMRI/4

2.1 The meeting reviewed the outcomes of the Fourth Meeting of the China, Mongolia, Russian Federation and IATA ATS Coordination Group (CMRI/4), which was held in Shenzhen, China between 4 and 6 March 2003.

ATS Routes and New Entry/Exit points into China

2.2 China advised the CMRI/4 meeting that CAAC had established a new route segment from the entry/exit point MORIT (between Mongolia and China) to Yabrai (DY) in October 1999 and SIMLI (between Russia and China) to Harbin (HRB) in March 2002.

2.3 The CMRI/4 meeting heard that after the opening of the POLHO entry/exit point, there would be a total of 7 entry/exit points into/out of China. These would be ARGUK, GOPTO, SIMLI and TELOK (between China and Russia), and INTIK, MORIT and POLHO (between China and Mongolia).

2.4 With regard to the new transition route joining route Polar 4 and Shanghai Pudong airport, China advised the CMRI/4 meeting that CAAC was undertaking a careful study on the possibility of opening a new route to shorten the flight distance. China was also evaluating the use of a current domestic route for use by international aircraft.

2.5 IATA had advised the CMRI/4 meeting that:

a) a new route segment and entry point was needed to replace TELOK in order to relieve the two hard turns after TELOK;

b) Polar 4 be made more available for northbound use as this was many times the preferred routing to North America;

c) Polar 1A be temporarily suspended and allow operations on Polar 2A, which was an airline requirement to be implemented; and

d) B480 between LETBI and Razdolye was unreliable for flight planning as on two occasions when this route was flight planned, a penalizing reroute was given by ATC to fly from Razdolye A91 SERNA A575 Ulaanbaatar B480 Bulgan.

2.6 In respect of the IATA comments, Russia advised the CMRI/4 meeting that airlines were not using TELOK. They would address northbound use of Polar 4 and RACGAT was addressing the B480 problem with a workaround route to LETBI. With regard to Polar 2A, Russia informed the CMRI/4 meeting that with the upgrading of Murmansk ACC, it may be possible to open Polar 2A. Mongolia advised the meeting that they could offer a SERNA direct MORIT (FANS 1/A route using ADS/CPDLC) to help with the B480 problem.

Flight Plan Approval Management by China

2.7 In line with the ICAO compromise position which was suggested at the CMRI/3 meeting (April 2002, Beijing), China informed the CMRI/4 meeting that they now had agreement to the arrangement whereby cross-Polar traffic into/out of China airspace could flight plan on any one of three entry/exit points into/out of China, with the notification of choice being transmitted to China at least one hour prior to the estimated departure time of the aircraft. This flexible choice procedure would be initially limited to the entry/exit points of ARGUK, POLHO and SIMLI.

2.8 IATA advised the CMRI/4 meeting that the China proposal was a good step forward for aircraft using Polar 3 and Polar 4 but the additional 47 NM to flights operating via Polar 1 or 2 from POLHO was unacceptable, especially to Hong Kong as these flights were already operating beyond their maximum passenger payload range. However, if a SERNA direct POLHO routing in Mongolia were available then the proposal would be acceptable, as it would provide a savings over the current routing over INTIK.

2.9 Mongolia advised the CMRI/4 meeting that they could offer a SERNA direct POLHO route to FANS 1/A aircraft using ADS/CPDLC. IATA welcomed the proposal as aircraft presently flying the cross-Polar routes could meet this requirement.

2.10 In regard to discussions on flight plan approvals for cross-Polar operations as well as routing via the new position of POLHO, the CMRI/4 meeting had agreed to the following:

a) As an interim solution, China would permit aircraft using cross-Polar routes to flight plan using a choice of three entry/exit points into/out of China, namely, ARGUK, POLHO and SIMLI with a target date for implementation of AIRAC date 15 May 2003;

b) Notification to China of flight plan details would be required at least one hour prior to the estimated time of departure (ETD);

c) Cross-Polar aircraft wishing to use other than the three mentioned entry/exit points above would be required to follow the present procedure of one entry approval into China airspace;

d) The entry/exit point of POLHO between Mongolia and China would be finalised by bi-lateral coordination between China and Mongolia with a target date for implementation of AIRAC date 15 May 2003;

e) New ATS route G218 SULOK – Choybalsan – POLHO – Tumurtai (TMR) would be finalised by bi-lateral coordination between China and Mongolia with a target date for implementation of AIRAC date 15 May 2003;

f) New ATS route B339 Ulaanbaatar – POLHO – Fengning (GM) would be finalised by bi-lateral coordination between China and Mongolia with a target date for implementation of AIRAC date 15 May 2003; and

g) New FANS 1/A route M520 SERNA – POLHO would be finalised by bi-lateral coordination between China and Mongolia with a target date for implementation of AIRAC date 15 May 2003. This route segment would be limited to FANS 1/A aircraft using ADS/CPDLC equipment on board.

2.11 The SCM POLAR & RTE noted that the increase of traffic utilizing the cross-Polar routes reflected the increased flexibility of the operation. Now new routes between Singapore/New York, Bangkok/New York, and Chicago/Shanghai had been or would be inaugurated, such different geographical locations as Singapore, Bangkok and Shanghai would entail the establishment of more entry/exit fixes and the modification to the current fixes. It was also apparent that flights from the Indian sub-continent to North America were not far away.

2.12 In this context, the meeting noted that the flight planning issues involved were challenging and complex. IATA recalled that some of these matters had been discussed during the CMRI/3 meeting (April 2002) and provided a copy of a relevant working paper (**Appendix C** refers) from CMRI/3 in relation to flexible flight planning requirements.

2.13 In conducting the review of CMRI/4, the meeting noted that a large number of the matters raised had been progressed by the Russian Federation. This was commendable and many of the airlines present acknowledged the ongoing work of the Russian Federation and congratulated the Russian Federation in attempting to address the needs of airline customers. The goodwill and collaboration displayed thus far would ensure that further improvements could be identified, discussed and implemented in this regard.

2.14 The meeting recalled and applauded the significant policy amendment that had been made by China during CMRI/4, which allowed the 3 entry/exit points into China airspace and had led to the greater flexibility in cross-polar operations that had been experienced in the last two or three years. In this context, the meeting noted that since that time new city pairs that had opened up and others were being proposed and recognized the importance of other entry/exit points options that are required to support these new operations. The airlines present again thanked China for the policy amendment and hoped that China could consider opening additional entry/exit points to accommodate the new city pairs and the general increase in traffic that had occurred, as well as the traffic growth forecast. The airlines thanked China for their continued willingness to work with airlines in opening access to new airspace and markets.

2.15 China noted the very positive response from airlines to the policy amendment, and assured the support of the CAAC for polar operations. China always endeavoured to provide the best ATS services possible and the policy change had also been a very big change for the CAAC. China was pleased to hear from airlines in this manner and asked IATA for additional information to explain the airline entry/exit requirements requested by airlines. IATA agreed to provide additional detailed information.

IATA - Russian Routes Access & the Anchorage Track Advisory Programme

2.16 IATA noted that there had been a significant increase in traffic utilizing the Russian Trans-East routes and cross-Polar routes over the last couple of years. A reference to year-over-year traffic increases (2003 to 2004) was recently presented at the Global Air Traffic Flow Management Conference (September 2005) in Ottawa, Canada by the Russian delegation, indicating a 41.5 percent increase in operations in the Russian Trans-East, and a 132.5 percent increase of operations using the cross-Polar routes.

2.17 IATA provided a review of the state of operations and air traffic services in relation to the cross-Polar and Russian Trans-East tracks, noting that demand continued to increase and frequently exceeded existing route capacities. Operators were now frequently forced to accept less than optimum routings and flight levels due to capacity constraints. IATA urged airlines and air navigation services providers to urgently work together to identify ways to increase airspace capacity and enhance air traffic flow management.

2.18 The FAA Anchorage Center provided a Track Advisory Program for access into Russian airspace from Anchorage airspace. The Track Advisory provided slot times for crossing specific points for all flights operating either between 1700UTC to 0700UTC, and from 0700UTC to 1700UTC. The primary demand for entry into Russian airspace was from 2000UTC to 0300UTC. Track Advisory included routes into the Russian Trans-East, and the cross-Polar routes, 2, 3 and 4 into Russia.

2.19 The following was an extract from the Track Advisory Guide for Dispatchers, provided by the FAA, illustrating the Anchorage Track Advisory parameters:

Route, track designator, coordination fix, longitudinal separation standards and useable altitudes are as follows:

Route	Track Designator	Fix	In-trail spacing	Useable Altitudes
A218	N	LISKI	20 minutes	96, 106, 116
B244	P	FRENK	20 minutes	96, 106, 116
G212	Q	YUREE	20 minutes	86, 96, 106, 116
G583	R	MARCC	20 minutes	96, 106
B480/G490	P2	DEVID	25 minutes	310, 350, 390
G491	P3	RAMEL	20 minutes	320, 340, 380
G494	P4	ORVIT	20 minutes	320, 340, 380

2.20 IATA highlighted to the meeting the following reasons for high demand for Russian Routes:

a) Upper air winds making the Russian routes the most desirable for flight time improvement over typical North Pacific routings;

b) A combination of faster flight times and payload demand that cannot be accommodated (payload) on the North Pacific routes;

c) Russian routes can save fuel on city pair services;

d) Significant flight time improvement requiring consideration to maintain passenger connections at Asian destinations;

e) Certain flights, such as New York or Chicago to Hong Kong can only operate on a year round basis by utilizing cross-Polar or Russian Trans-East routes due to aircraft limitations or en-route operational considerations; and

f) Less traffic (at times), less turbulence or en-route significant weather than non-Russian routes.

2.21 It was noted that there were also several factors why Russian Routes were not chosen, and flights would operate over the Non-Russian North Pacific routes in preference;

a) Russian over-flight navigation charges compared with non- Russian routes;

b) Operators have a choice of avoiding Russian airspace, by using the North Pacific routes;

c) Flight time savings and fuel savings flying Russian routes did not off set Russian over flight navigational charges;

d) Payload demand does not warrant paying the additional over flight fees;

e) North Pacific routes are not "slot" allocated;

f) Capacity is limited on the Russian routes based on number of route choices and flight levels available;

g) North Pacific routes have more efficient flight levels due to RVSM. For example, most Russian routes are limited to three flight levels, 9600, 10600, and 11600 meters, whereas North Pacific routes have up to 10 RVSM levels;

h) Selecting a Russian route with high traffic demand could result in being forced to accept a less optimum flight level either in initial planning or due to tactical decisions approaching the Russian entry point. (**Appendix D** refers);

i) There is no Track Advisory Program for Polar 1 operations and therefore the traffic demand is not known when operators are flight planning cross-Polar flights;

j) Eastbound traffic from Russia over the cross-Polar routes has also seen an increase year over year, and having an Air Traffic Flow Management tool to review planned operations would be beneficial to operations and ATS providers as well; and

k) There are currently quota limitations and also additional limitations on freighter access − if/when these are liberalized, traffic will increase yet again.

2.22 It was further noted that Polar 4 could not be used for Saturday departures from North America due to Russian staffing issues in some area control centers (ACC). As an example of how the closure of Polar 4 could affect the flow of aircraft for a Saturday departure, the October 15, 2005 Anchorage gateway reservation list (GRL) was provided (**Appendix E** refers).

2.23 As an example of some of the typical difficulties being experienced, IATA reported that UAL801 New York to Tokyo had to plan Russian entry at LISKI (A218 and B337 routing) because the ORVIT entry was not available for Saturday departures (Closed ACC's were Chokurdakh, Zyryanka, Tyoply Klyuch).

- LISKI route was 24 minutes longer than ORVIT
- LISKI route required 9,100 pounds more fuel burn than ORVIT and denied 6,400 pounds of revenue cargo
- LISKI route resulted in a 20-minute wheels up delay for a slot

What can be done to improve route efficiency and capacity?

2.24 In light of the foregoing, the meeting considered that the following steps should be considered in attempting to alleviate the congestion in the cross-Polar Routes and Russian Trans-East airspace:

a) Open Polar 4 access at ORVIT for Saturday departures from North America. *Note: On 26 November 2005 the Russian Federation opened this route 24hour/7days week.*

b) Open Polar 3 access for Saturday departures from North America that transition through currently closed ACC's. *Note: the Russian Federation reported that this was partially implemented and work was continuing;*

c) Increase access to 24 hours for all routes,(LISKI, ORVIT, RAMEL currently limited);

d) Consider new entry points, such as one at 72 north latitude, referred to as Chukotka 2 on the RACGAT/13 route catalogue. This could provide significant improvement to accessing Russia and alleviate some traffic from Polar 4 and traffic over LISKI. *Note: the Russian Federation reported that this was partially implemented and work was continuing;*

e) Consider the implementation of RVSM in the Arctic region. Additional flight levels would significantly increase capacity and efficiency. Transitions between flight level systems could be eliminated;

f) Consider some ATS routes as westbound only, during certain hours when traffic demand is greatest. This could add at least one more flight level during peak demand periods. LISKI A218 would be a potential candidate for this suggestion;

g) Consider reducing the "window" for slots from ten minutes to five minutes;

h) Consider reduced separation minima on some routes to 50 NM longitudinal separation, or 30 NM separation for RNP4 aircraft;

i) Segregation of routes or flight levels by aircraft capability (CNS/ATM);

j) Request the FAA to upgrade the Track Advisory Program to a web-based, dynamic product; and/or

k) Develop a cooperative Air Traffic Flow Management relationship with Nav Canada, the FAA, and Reykjavik ACC to provide real time coordination of traffic matters in the cross-Polar and Russian Trans-East route structures.

2.25 As this matter involved many ACCs in Russia, the Russian Federation agreed to bring the proposal back and circulate it to the ACCs. It would probably take some time to see improvement but the Russian Federation advised the meeting that they were now aware of the airlines' needs and would work actively towards addressing the situation.

2.26 IATA expressed appreciation to the Russian Federation. Even though IATA would like to see the improvement as early as possible, they realized that continuation of coordination was still necessary. In this regard, IATA expressed that the issue of the westbound flight from Canada and the United States to the Russian airspace should continue to be addressed at the RACGAT, and the issue of growing demand for Chinese airspace should be discussed at the CMRI. These were valuable meetings that should be reactivated as soon as possible.

Capacity Optimization on Cross-Polar/Trans-East Routes

2.27 The Russian Federation informed the meeting that there was presently a vast difference in the application of longitudinal separation minima for Nav Canada, Anchorage ARTCC and the Russian Federation on cross-Polar and Trans-East routes, ranging from 30 kilometers to 20 minutes. Furthermore the longitudinal route capacity at the entry points into the Russian airspace is reduced on average from 6 to 2.5 aircraft per hour the same flight level.

Longitudinal Separation on Cross-Polar routes

2.28 The control of cross-Polar routes is presently shared by Anchorage ARTCC, Reykjavik, Murmansk, Magadan, and Edmonton ACC's. Capacity on these routes is severely limited due to the variation of longitudinal separation minima from one ACC to the next (30 kilometers to 15 minutes) and the additional 10-minute window imposed by Anchorage ARTCC.

Trans-East routes

2.29 Anchorage ARTCC provides a 10 minutes longitudinal separation plus a 10 minute flow management window for the following entry points into the Russian airspace: YUREE, LISKI, FRENK and MARCC. It was noted that Anchorage ARTCC accepts eastbound flights from the Russian airspace at 10 minute longitudinal separation minima.

2.30 The Russian Federation provides a 30 km longitudinal separation under radar control and 10 minutes under procedural control with the exception of B337 (LISKI) where 20-minute longitudinal separation minimum is applied. There are operational hour limitations for Russian ACCs in Yakutia and Chukotka, which affect the availability of Cross-Polar (Polar 3 and 4) and Trans-East routes. Anchorage ARTCC does not appear to take into account the limitations of Russian ACCs when allocating slots to airlines.

2.31 The Russian Federation had been making efforts to remove the restrictions imposed by the limited coverage of certain Russian ACCs. Thus, effective from 15 November 2005 Tiksi (UEST) ACC will take over control of Chukordakh (UESO) FIR and Yakutsk (UEEE) ACC sector "North-East" will begin providing air traffic services in Batagai (UEBB) and Tyoply Klyuch (UEMH) FIRs. This will open Polar 3 and Polar 4 for 7 days a week and H24 operations. Note: H24 operations on Polar-3 will be available if flight-planned in detour of Zhingask ACC (UEVV). Route G806 and B933 from UESO will still have limitations due to limited coverage of Zyryanka (UESU) ACC.

2.32 The transition to RVSM on cross-Polar/Trans-East routes as requested by the airlines would help to increase the route capacity, but so far the Russian Federation has been unable to implement RVSM on these routes. There were a number of complexities involved, including the numbers of older aircraft operating in the Russian Federation that were not compliant with the strict altimetry requirements of RVSM.

2.33 The Russian Federation provided the following suggestions for consideration by the meeting in order to mitigate the issues concerning the ineffective provision of longitudinal separation on cross-Polar and Trans-East routes.

a. Make an inventory of the existing longitudinal separation minima on the above routes in each FIR.

b. Describe the current technical problems that force a particular ACC to implement extended longitudinal separation or additional time windows. Develop possible solutions.

c. Review the possibilities for reducing or removing additional time windows applied by certain ACCs in addition to longitudinal separation minima.

d. Continue removing the remaining en-route restrictions caused by limited operational hours of certain ACCs.

e. Consider the possibilities for optimizing the number of ACCs involved in provision of air traffic services on cross-Polar and Trans-East routes.

f. In the view of increasing traffic demand on cross-Polar and Trans-East routes, initiate development and signing of Letters of Agreement between Main ATFM Centre of Russia (MATFMC), Nav Canada National Operations Centre (NOC) and FAA Air Traffic Control System Command Centre (ATCSCC)/Anchorage ARTCC for the purpose of carrying out optimization of route capacities and efficient air traffic flow management on the above routes.

2.34 The Russian Federation requested that the 10 minute window added by the FAA be reduced to 5 minutes, which would result in a significant increase in airspace capacity. The United States responded that the request would be brought to the attention of ATCSCC and requested the point of contact of the Russian Federation. Also, the United States expressed their support to the continuation of RACGAT to address these issues.

2.35 The meeting was restricted by the limited time available, but thanked the Russian Federation for these very valuable proposals to assist the situation. The matters would be recorded and discussed by the States concerned in order to progress the matters raised. The opportunities presented during regular bi-lateral State meetings would also be utilized in this respect.

Harmonized vertical separation in North Asia

2.36 The Ulaanbaatar Area Control Centre provides enroute ATS for traffic within the Mongolian airspace, with average weekly international traffic movements of 900 flights traversing China, Mongolia, Russia and vice versa. The contiguous airspaces require close coordination between China, Mongolia and Russia on a daily basis.

2.37 The current vertical separation standards in use for Mongolian and Russian airspace are 300 meters below 8100 Metric Standard (MSTD), 500 meters above 8100 MSTD and 1000 meters above 12100 MSTD. These common vertical separation standards allow an uninterrupted flow of air traffic between the two countries.

2.38 On the other hand, China had adopted a different non-ICAO metric flight level standard, which necessitates a flight level transition area at both ends of the airspace, requiring air traffic controller intervention to adjust the levels of every flight prior to entering any FIR outside of China. This introduces significant controller workload.

2.39 During 2003, Russia informed Mongolia that it intended to implement RVSM in Russian airspace and requested cooperation to implement RVSM in Mongolian airspace at the same time.

2.40 In view of the above, Mongolia proposed that a unified flight level standard be considered by States concerned, with the objective of future implementation of RVSM in this sub-region. IATA suggested that RVSM should at least be implemented in Mongolia and China before the 2008 Olympics in China.

2.41 The Russia Federation expressed that RVSM should be implemented in a harmonized manner. In this regard, RVSM should be implemented in a whole airspace, not on an airway-by-airway basis. Also, the Secretariat drew the attention of the meeting to the relevant provisions of Annex 2 – *Rules of the Air* where the standard RVSM levels are provided (in feet or meters) and from which a harmonized flight level system could be derived. On the other hand, the Russia Federation drew the meeting's attention to several difficulties that needed to be addressed to implement RVSM, e.g. RVSM non-compliant fleet, transition between RVSM in feet and RVSM in metric. The meeting noted that even in the best possible circumstances, implementation of RVSM in Mongolia and the Russian Federation was at least two years away.

Parallel Air Route to A575

2.42 Mongolia informed the meeting that A575 had been the only major route connecting Europe and East Asia, with 48% of international flights passing through the Entry/Exit point INTIK which has no surveillance capability. Current air traffic situation in Mongolia was provided as attached as **Appendix F** to this Report. Furthermore, the route was joined by B339 and A91, which required that the flight levels be converted to China metric flight levels prior to entering China airspace. Accordingly, during peak hours, ATC workload exceeded the capacity of the Mongolian CAA.

2.43 As a consequence of the above and also the expected peak traffic during the Beijing Olympics in 2008, Mongolia had proposed to China and Russia that a new air route parallel to the west of A575 be opened. The Russian Federation had provisionally accepted a new entry/exit point next to DARNO while a high- level discussion with China of this issue is still ongoing. IATA advised the meeting that such a parallel route west of A575 would save about 160 NM for flights whose destinations were south of Beijing, i.e. Hong Kong.

2.44 The Russian Federation reported that the traffic increase was also observed in Russia for A575 on DARNO. The meeting agreed that bi-lateral and tri-lateral meetings between the Russian Federation, China and Mongolia would be beneficial to discuss further the establishment of the parallel route and the States involved agreed to follow up and convene a meeting in this regard.

2.45 Mongolia urged the opening of this parallel route as soon as possible in order to realise improvements in safety, efficiency and capacity for airspace users as well as the reduction in ATC workload.

2.46 IATA suggested that the parallel route could be established between UNWW in Russia and Weixian in China. China responded that restricted airspaces were located around Weixian and it would be difficult to establish the route.

2.47 The meeting recognized that a significant increase of traffic in this area was likely as a result of the Olympic Games to be held in Beijing during 2008 and that it was critically important to ensure that a suitable ATS route structure was in place. The meeting agreed that the implementation of RVSM should be pursued as widely and as soon as possible and noted that although the transition from ICAO feet to China metric was complex, there were provisions for RVSM using metric levels included in ICAO provisions and the use of flight level transition areas would readily accommodate changes in levels.

2.48 The meeting recognized the significant equipment and associated infrastructure costs, as well as the long implementation time frames that would accrue to Mongolia if additional surveillance capability like radar or ADS B had to be installed to increase the route capacity. A parallel route was a simple and robust solution that would also assist over flight traffic in the Beijing area by providing tracking clear of Beijing, and would also provide an alternative route to Shanghai.

2.49 The Regional Office noted the positive and collaborative discussions that had occurred in respect to this matter and urged all parties to continue to work together in this regard. The meeting recognized the difficulties for China in establishing new entry/exit points but urged China to give strong consideration to the proposal for a parallel route. China would consider the proposal and discuss during the appropriate State bi-lateral meetings.

Air India Operations – India/North America

2.50 Air India informed the meeting that they were planning to operate direct flights between DEL, BOM and JFK, EWR, ORD from the first quarter of 2007 with new B777 LR aircraft. These would be a 180-minute ETOPS operations and it was anticipated that these flights would primarily utilise routes over northwest Russia and Finland, as these were shorter routes in terms of track distance. In the case of Polar operations, it was anticipated that these flights would use G489 and G490.

2.51 The next phase of operations would be between India and the west coast of the USA. These flights will invariably be over the Polar region or over Pacific routes.

2.52 Air India requested assistance by way of the sharing of information by airlines which had experience in cross-Polar operations, with particular focus on suitable en-route diversion airports for planning 180-min. ETOPS flights. In addition Air India requested assistance with temperature charts and solar activity and communications outage procedures for Polar flights. In this regard, the meeting agreed that Air India would contact airlines that were experienced with Polar operations.

Agenda Item 3: Cross-Polar/Russian Trans-East ATS route review – Asia/North America traffic flows

Thirteenth Meeting of the Russian/American Coordinating Group for Air Traffic Control (RACGAT/13)

3.1 The meeting reviewed the outcomes of the Thirteenth Meeting of the Russian/American Coordinating Group for Air Traffic Control (RACGAT/13), which was held in which was held in Vladivostok, Russia on 20-23 October 2003.

3.2 The RACGAT/13 meeting had continued the development of a RACGAT Route Catalogue. This document was designed as a planning aid for ATS providers in the RACGAT service area. The first version of the route catalogue was published in April 2004.

3.3 The RACGAT/13 meeting was updated on national and regional activities since the RACGAT/12 meeting, noting the many improvements that had occurred and the many that were in progress and in planning.

3.4 RACGAT did not meet in the Mini-RACGAT format in the spring 2004 timeframe. Both the State Civil Aviation Authority of Russia and the United States Federal Aviation Administration were undertaking significant realignment of their ATS organizations. Pending the outcome of these processes, the United States was tentatively scheduled to host the next RACGAT meeting in late October 2004. However, this did not occur.

3.5 IATA advised the meeting that the RACGAT meeting forum was a very important mechanism to discuss ATS route issues and, as a RACGAT meeting was long overdue, urged both the Russian Federation and the United States to consider convening a RACGAT meeting in the immediate.

Russian Federation Update

3.6 The Russian Federation updated the meeting in respect of the current issues relating to improvements to the cross-Polar/Trans-East ATS route network and optimization of Trans-Siberian routes.

3.7 The Russian Air Traffic Management (ATM) system covers nearly 25 million square kilometers in both sovereign and international airspace (**Appendix G** slide 1 refers). The system consists of some 113 centers; however it was intended by the Russian Federation that a consolidation of ACCs would commence in the medium term, with a view to reducing the number of ACCs to less than 15 ACCs over the next 10-15 years. The ATM system supports operations on the following 6 major ATS route systems (**Appendix G** slide 2 refers).

a) Asian - Southern Europe via Georgia and Azerbaijan to Iran/Afghanistan;
b) Trans-Asian - Central Europe via Kazakhstan to Pakistan/ India and via Mongolia and China to Southeast Asia;
c) Trans-Siberian - Northern Europe to Japan
d) Trans-Polar;
e) Cross-Polar; and
f) Trans-East.

Cross-Polar Routes

3.8 This route system consists of 4 main ATS routes, as described below, which have recently experienced tremendous growth in traffic volumes (**Appendix G** slide 3 refers). The track distance savings compared to non-Polar routes could be as much as one thousand miles.

a) **Polar 1** - flights between central part of North America and India/Pakistan;

b) **Polar 2** - flights between central and eastern parts of North America and Malaysia/Singapore/Thailand/Indonesia;

c) **Polar 3** - flights between central and eastern parts of North America and China/Hong Kong/Taiwan/Philippines; and

d) **Polar 4** - flights between central/eastern parts of North America and China/Hong Kong/Taiwan/South Korea and a large number of link-routes.

3.9 The opening of cross-Polar routes for regular operations was enabled following a significant number of demonstration flights. The maiden demonstration flight across the North Pole from Krasnoyarsk to Toronto was made on July 3, 1998 by the Russian airline Transaero. United Airlines (UAL), Northwest Airlines (NWA) and Cathay Pacific Airways (CPA) greatly contributed to the demonstration program by conducting the bulk of Cross-Polar testing, making 479 demo flights between 1998 and 2000.

3.10 The cross-Polar routes are presently used by the following 7 airlines on a regular basis: United Airlines (UAL), Cathay Pacific Airlines (CPA), Air Canada (ACA), Continental Airlines (COA), Singapore Airlines (SIA), Air China (CCA) and Thai Airways International (THA). Traffic also includes some episodic ferry flights and charter operations by other airlines and business aviation operators.

3.11 Additional US and Chinese airlines such as UPS, FedEx, Delta and China Eastern are expected to start using cross-Polar routes following the completion of intergovernmental talks between US and China in 2006. There is also a strong interest in cross-Polar operations from airlines based in India and Pakistan, including Air India and Pakistan International, as well as additional interest from Emirates, China Airlines, Asiana, Korean and EVA air. ICAO 2005 – 2006 forecasts suggest that annual growth of over 6 % will be maintained in these regions. (**Appendix G** slides 4 and 5 refer).

3.12 In addressing the above considerations, the State ATM Corporation made some improvements to the above routes by establishing a number of link-routes which enabled transitions between the routes to utilize optimal wind patterns.

a) New route B934 from UOHH (Khatanga) – USATO (7612.0 N 09903.0 E) – BINTA (7744.7N 09559.0 E) – UODS (Ostrov Sredny) – ABERI

b) New route R494 from UEEE (Yakutsk) – LM (Sangar) (6357.6 N 12725.9 E) – UEVV (Zhigansk)

c) Realignment of G491 from UR (Chagda) – ARKOD (5519.5 N 12720.8 E) – LAVIR (5448.3 N 12718.2 E) – ZABAN – SOVIK – NINON – BANIR – BLG (Blagoveshchensk) – SIMLI

3.13 The following arrangements were also made to increase efficiency of the route systems:

a) Irkutsk (UIII) ACC increased the availability of B480 LETBI – Razdolye BD route to allow westbound flights via LETBI to Polar-2, making the route fully available without any restrictions from 1400 to 2359Z, and available on request from 0000 to 1359Z;

b) New way point DIBOR (5136.5 N 11735.7 E) was established at the crossing of G492 and G496, enabling transition from G492 to G496 to detour GABAL – DEDUN segment of G491 in case of NOTAM closure;

c) New entry/exit point was established at VAMOL (5022.5 N 10452. 5 E) on Russia/Mongolia border between LETBI and SERNA; and

d) New route R478 BD (Razdolye) – VAMOL (5022.5 N 10452. 5 E) was implemented.

Trans-East Routes

3.14 Adjacent to cross-Polar routes are the Trans-East routes. During 2004 alone, traffic volumes increased by 41.5 % due to the expansion of services between North America and Southeast Asia. In recent times, the following new route segments and arrangements were implemented to increase the efficiency of the route systems:

a) new waypoint LALET (5005 N 13714 E) at crossing of A204 and G212;

b) new route B936 - RELPI (4935.4 N 13626.2 E) – ABORI (4944.5 N 13640.6 E) – LALET;

c) B223 was extended from BA (Balagannoye) to AKSUN;

d) B233 was realigned from ODORA to DE (Yedinka);

e) new route B933 UESO(Chukordakh) to UHSH (Okha) (joins Polar-4 with B233)

3.15 Additional routes were made available as follows, initially restricted to Russian-speaking flight crews only (**Appendix G** slide 6 refers). Work is continuing with a view to lifting this language restriction, in order to open the routes as international routes.

a) new route B913 TERBA – SONID – NASAN – LOKIS;

b) new route B915 UB (Ust Bolsheretsk) – QI (Troitskoe); and

c) new route B916 INOKA – VALAM - ZONAL

3.16 IATA stressed that the westbound North Pacific operations could be significantly affected by the very strong winter jet stream. The three Russian Trans-East (RTE) routes, namely B913, B915 and B916, were more immune to the strong winter wind patterns and therefore were important transition routes, especially during winter months. IATA urged the removal of the Russian language restriction as soon as possible to enable these routes to be commissioned for international airlines. If, for example, only an 8-hour segment could be provided with English-speaking controllers,

then IATA offered to assist in identifying the 8 hour segment that would be most beneficial to airlines.

ATS Services

3.17 The State ATM Corporation has also continued planning to improve the quality of air traffic services provided and enhance route network and airspace utilization. The following actions have been already accomplished (**Appendix G** slide 7 refers):

a. two oceanic sectors have been established at Murmansk and Magadan ACCs to improve air traffic management over the Arctic Ocean;

b. effective from November 15, 2005 Tiksi ACC (UEST) will begin providing air traffic services outside the published operational hours of Chukurdakh ACC (UESO). Until November 15, North-East sector of Yakutsk ACC (UEEE) will commence controlling traffic in Batagai (UEBB) and Tyoply Klyuch (UEMH) FIRs. This will enable opening of Polar 3 and Polar 4 for H24 operations (7 days a week).

Note: H24 operations on Polar 3 will be possible in detour of Zhigansk ACC (UEVV). NOTAMs A5603/05, A5605/05, A5607/05 refer.

3.18 During the next phase it is planned to establish satellite communications links under the Yakutsk ACC consolidation program. This will enable H24 coverage at the two remaining FIRs Zhigansk (UEVV) and Zyryanka (UESU) affecting Cross-Polar flights in Yakutia. The State ATM Corporation is also planning technical solutions to enable expansion of ATC coverage in other FIRs in Eastern Yakutia and Chukotka to enable H24 operations on Trans-East and Chukotka routes (Mys Shmidta (UMHI) ACC, etc.).

3.19 The State ATM Corporation will continue to establish new airways and ink-routes to allow flexible use of cross-Polar routings. Presently, evaluation of the airline proposals for new transition routes described below have commenced and are shortly expected to be circulated to regions for further coordination and action (**Appendix G** slide 8 refers).

a) from Polar 4 (G494) ORVIT to Polar 3 (G491) TIGLA,
b) from Polar 3 (G491) RAMEL to Polar 4 (G494) TURDI and
c) from Polar 3 (G491) to BESON/ENODI (B480).

3.20 Shorter routing from North America to India and Pakistan in addition to Polar-1 is being considered, with the following shortcuts on AKATI – LANOR (entry point to Kazakhstan) routing contemplated (**Appendix G** slide 9 refers):

a) KUMEN - UUYY (Syktyvkar) (W95 domestic route will be assigned an international status), and

b) KUMEN – SOTIS.

3.21 A proposed amendment to establish additional route segments to allow a detour of SULOK-IDRAN portion of G491 in the event of NOTAM closures is going through the necessary coordination. Additional non-compulsory reporting points have been established on G491 and G494 by NOTAM (A5453/05, effective date - November 1, 2005) (**Appendix G** slide 10 refers). Work is also in progress to remove existing restrictions for foreign airlines on B915 and B916, which will become available for flights from UB (Ust-Bolsheretsk) – ZONAL – INOKA – B233 - Yedinka.

3.22 Work is underway to implement the Chukotka routes as depicted in the RACGAT/13 catalogue. Currently, a new entry/exit point PILUN (N72 W 16858.4) for Chukotka-2 and Chukotka-3 has been agreed and published in the airways list (internal document) (**Appendix G** slide 11 refers). Similarly, the first segment of Chukotka 2 from PILUN to Pevek (UHMP), designated B970 has been agreed and published in the airways list. The following segments are still in work:

a) Chukotka 1 LISKI to Pevek (UHMP) to Zyrynka (UESU) to Oymiakon to Chagda,

b) Chukotka 2 PILUN (N72 W 16858.4) to Pevek (UHMP) to Omolon (UHMH) to Takhtayamsk, and

c) Chukotka 3 PILUN (N72 W 16858.4) to Petin (N7033.2 W 15555) - VIKBI

Coordination with neighbouring States

3.23 Coordination with adjacent States such as China and Japan continues with the intention of increasing the number of entry/exit points. Nevertheless, the State ATM Corporation has encountered some problems in coordination with Civil Aviation Administrations (CAAs) of neighboring States when trying to optimize airspace and route structures.

3.24 ATS Route Kamchatka-4 (B932) was established as a demonstration route in accordance with the MoU between CAAs of Russia, Japan and US, which was subsequently renewed for the period from March 17, 2004 until September 29, 2005 (**Appendix G** slide 12 refers). However, only one demo flight was operated - on December 19, 2004 by United Airlines - and, unfortunately, it was impossible to assess the quality of air traffic services and provision of flight safety on this route on the basis of a single demo operation. As the MOU expired in September and Japan was silent in respect of its renewal, the State ATM Corporation was forced to close this route until January 1, 2006.

3.25 IATA informed the meeting that the Kamchatka-4 could offer significant savings during winter months and at least 3 airlines (CPA, NWA and UAL) offered to conduct further demo flights. The meeting considered that confusion as to the availability of this route had probably led to the low traffic numbers, but wished that the route be retained. The Regional Office would alert Japan that the MOU had expired and advise them of the interest shown during this meeting in continuing with this route. Once the MOU was re-established, the Russian Federation would issue a NOTAM enabling the demonstration flights.

3.26 In respect of Trans-Siberian route network improvements, 75 new international airway segments including the following segments on Trans-Siberian routes were implemented on July 6, 2005 (**Appendix G** slide 13 refers):

a) UEMO (6023.3N 12028.3E) – LODKI (6200.5N 11920.1E) – UENN (6318.0N 11820.0E);

b) Tobolsk (5808.5N 06816.6E) – UNKIS (5742.0N 07110.0E) – ROBLA (5633.2N 07723.8E) – Severnoye (5620.1N 07821.6E) – Novotyryshkino (5517.0N 08224.0E);

c) Achinsk (5616.3N 09036.7E) – BALAV (5559.0N 09114.0E) – KESUM (5415.7N 09615.5E) – ABEGI (5142.1N 10214.8E) – VAMOL (5022.5N 10452.5E); and

d) Maksimkin Yar (5838.0T 08644.0E) – SOTIM (6010.7N 08023.0E) – UNSS Strezhevoy (6042.6N 07739.6E) – BERIP 6046.2N 07721.8E) – Nizhnevarovsk (6056.6T 07628.1E).

3.27 In the framework of Trans-Siberian route optimization, Russia had already undertaken a significant work programme and was prepared to implement new route segments. The meeting congratulated Russia on their route improvements. However in order to advance this activity, the Russian Federation had recognized that the State ATM Corporation needed to reach a common understanding with Civil Aviation Administration of the People's Republic of China and was seeking the cooperation of China in engaging in mutually beneficial coordination.

3.28 The meeting noted that the implementation of RVSM was another solution to increase the airspace capacity. Russia informed the meeting of the current situation to introduce RVSM in Russian airspace. Particularly, Russia was confronted with the issue of consistency in the operation with neighboring FIRs where feet or different metric systems are being used, however Russia advised the meeting that preparations to implement RVSM in Russian airspace were continuing.

3.29 In responding to the update from the Russian Federation, Mongolia sought clarification in respect of the new entry/exit point VALMO, noting that it could serve to assist traffic on the Trans-Siberian routes as well as avoiding restrictions on the LATVI route. In respect of B480, Mongolia appreciated the lifting of restrictions at LETBI.

3.30 Mongolia offered to make a route segment connecting existing entry/exit points NIGOR – TEBUS available as an international route. In noting that this would support operations on Polar 1, the meeting appreciated the offer from Mongolia and agreed that this would be further considered in bi-lateral discussions in due course with a view to implementing this route segment.

New Routes – Seoul/Russian Trans-East and Trans-Siberian

3.31 IATA reported that the successful implementation of B467 provided a huge relief over the old existing routes between Seoul and the Russian Trans-East and Trans-Siberian routes. IATA had met separately with officials from Republic of Korea (ROK), Democratic People's Republic of Korea (DPRK) and Russia (Vladivostok officials) to discuss the possibility of new routes to Gangwon (ROK) that would allow fuel saving routings for flights bound to Seoul. The meeting was informed that these discussions had produced the following potential new routes (**Appendix H** refers) that revolve around a new ROK/DPRK border crossing point "X-ray" at N39 15.0 E129 50.0.

a) SESUR (N42 17.5 E130 41.5) - Pt X-ray (N39 15.0 E129 50.0) - Gangwon (KAE)
Saves 72 nm over current route

b) TEKUK (N42 41.0 E135 27.4) - Pt X-ray (N39 15.0 E129 50.0) - Gangwon (KAE)
Saves 70 nm over current route

c) Muraveyka (BG) - TELOD (N42 19.6 E132 11.8) - Pt X-ray - (N39 15.0 E129 50.0) - Gangwon (KAE)
Saves 123 nm over current route

3.32 IATA reported the meeting that they had an opportunity to discuss with officials of DPR Korea the efficiency in this area. Now that DPRK together with the Republic of Korea and the Russian Federation had in principal agreed with the proposal, and the expected savings would be significant, the next step would be to agree on the point presently referred to as "point X-ray" (see Appendix G).

3.33 IATA suggested a meeting between DPR Korea, Republic of Korea, Russian Federation and IATA in Vladisvostok to discuss possible implementation. The Russian Federation accepted this proposal and IATA agreed to coordinate a meeting in Vladivostok with all parties. It was noted that the USA currently has a SFAR restricting any operations by US air carriers west of NULAR in the Pyongyang FIR. The USA representative agreed to advise the US State Department of this new route proposal and its benefit to air carrier operations, with a view to lifting the restriction.

New Routes – India/North East USA

3.34 IATA reported that the North America to India city pairs were giving rise to new long range route requirements. For example the Newark, USA to Delhi, India normal flight plan route was as follows:

1. KOMEK.B487.PT.B158.SU.B210.ANOAT.B211.USKK.G367.
2. NEDRA.G351.RGB366.VL.A360.MULTA

3.35 As this routing was not designed to serve to the city pairs, IATA requested the meeting to consider a more efficient routing of:

KOMEK..N60E40..N55E50..MULTA (**Appendix I** refers)

3.36 The meeting noted that this proposed route represented a 93 NM saving over the existing route. For a typical B777, one of the more fuel efficient long-haul aircraft, the fuel savings would be in the order of 2,825 lbs. The Russian Federation advised the meeting that while the IATA proposal most likely could not be implemented exactly as proposed, they are already working on such improvements through the European Route Development Group.

3.37 In response to the query on the most suitable forum in which to discuss this matter, the meeting noted that the area concerned was under the jurisdiction of the ICAO EUR/NAT Office in Paris and agreed that the proposal be brought to the attention of Paris Office.

New Routes – IACA Proposal

3.38 The International Air Carrier Association (IACA), with headquarters in Brussels, Belgium, represents a significant number of international air carriers predominantly serving the leisure industry and serving 600 holiday destinations worldwide. Correspondence had been received from IACA by the Regional Office in respect of facilitating coordination with affected States in respect of route proposals raised by IACA. The Regional Office routinely provides assistance with regard to establishing effective communication links between affected parties in regard to civil aviation matters.

3.39 Several IACA member carriers had recently increased their flights to China, mainly Beijing and the meeting noted proposals from IACA in respect of 4 ATS route segments affecting route structures in Urumqi, Lanzhou, Beijing, Wuhan and Shanghai FIRs (**Appendix J** refers). The Regional Office had conducted an initial review of the proposals and had not identified any conflict or impediment in terms of regional planning issues. China would review the proposals in due course.

Agenda Item 4: Any other business

4.1 The meeting did not identify any other business to be discussed.

5. **Closing of the Meeting**

5.1 As this meeting was a Special ATS Coordination Meeting to address a limited agenda, the meeting did not specify a date for further meetings of this kind. However, there was very strong support from all participants for the good work and valuable outcomes that had been achieved by the meeting. This highlighted the need for the RACGAT and CMRI forums to meet at regular intervals and the meeting was of the very strong opinion that these forums should be reconvened at the earliest opportunity.

5.2 The meeting recognized that, in addition to forecast general traffic growth, the Beijing Olympic Games in 2008 would lead to a significant regional and sub-regional traffic increase and that it was important that preparations to manage the traffic increases were completed in good time. As China would necessarily experience a lot of the traffic pressure associated with the Games, the meeting considered that every assistance should be offered to China by neighbouring States, ICAO and IATA, and that China was encouraged to seek assistance as required.

5.3 In this context, the meeting considered that the a CMRI meeting would have the potential to provide a focus for preparations for the 2008 Olympic Games, providing further justification for its early reactivation.

5.4 In closing the meeting, Mr. Tiede acknowledged the goodwill and spirit of collaboration that had characterized the meeting from the outset. It was evident that all participants had attended the meeting with the intention of working effectively and collaboratively and this was reflected in the many positive outcomes from the meeting. Mr. Tiede noted and thanked the Russian Federation for the continued work that had been undertaken since the last CMRI and RACGAT meetings more than 2 years ago.

5.5 The Heads of Delegation thanked the Regional Office for their proactive role in arranging and holding the meeting. All delegations considered that valuable outcomes had been achieved by the cooperation and exchange of information that had taken place, and that further regular meetings would enable this work to be continued effectively. Good progress could also be made in working via correspondence and telephone, however face to face contact was a much more effective way to communicate and the meeting agreed with the sentiments of the Russian saying as expressed by the Head of the Russian Delegation, that “it was better to see once than to hear 10 times”.

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Mr. Randy Rohan	System Manager Flight Control – International Operations Delta Air Lines Inc. Department 019 P.O. Box 20706 Atlanta, GA 30320-6001 U.S.A.	Tel: 1-404 715 0212 Fax: 1-404-773 0708 E-mail: Randy.rohan@delta.com
Mr. Manoch Suesat	Senior Flight Operations Officer Operations Support Department Thai Airways International Public Company Limited Room 4214 Central Block Bangkok International Airport Bangkok 10210, Thailand	Tel : +66 2 535 2450 Fax : +66 2 504 3814 E-mail : manoch.s@thaiairways.com
Mr. Jung Sik Kim	Asst Gen Manager Korean Air 1370, GongHang Dong GangSeo Gu Seoul, Republic of Korea	Tel: 82-2-2656 6249 Fax: 82-2-2656 6289 E-mail: jskimatc@koreanairco.kr
ICAO		
Mr. Andrew Tiede	Regional Officer, ATM ICAO Asia and Pacific Office 252/1 Vibhavadi Rangsit Rd Ladyao, Chatuchak Bangkok 10900 Thailand	Tel: 66-2-5378189 ext. 152 Fax: 66-2-5378199 E-mail: atiede@bangkok.icao.int
Mr. Kyotaro Harano	Regional Officer, ATM ICAO Asia and Pacific Office 252/1 Vibhavadi Rangsit Rd Ladyao, Chatuchak Bangkok 10900 Thailand	Tel: 66-2-5378189 ext. 159 Fax: 66-2-5378199 E-mail: kharano@bangkok.icao.int

LIST OF WORKING PAPERS (WPs) AND INFORMATION PAPERS (IPs)

WORKING PAPERS

NUMBER	AGENDA	TITLE	PRESENTED BY
WP/1	1	Provisional Agenda	Secretariat
WP/2	2	Summary of Discussions at the Fourth Special ATS Coordination Meeting – China, Mongolia, The Russian Federation and IATA (CMRI/4)	Secretariat
WP/3	2	Russian Route Access-Anchorage Track Advisory Program	IATA
WP/4	3	New Route Proposals between Seoul and the Russian Far East and Trans-Siberian	IATA
WP/5	3	New Route Proposal between NE USA and India	IATA
WP/6	3	ATS Routes B913, B915 and B916	IATA
WP/7	2	Harmonized Vertical Separation Minima in the North Asia	Mongolia
WP/8	2	Parallel Air Route to A575	Mongolia
WP/9	3	Current issues pertaining to improvements to Cross-polar/ Trans-East ATS route network – Update on optimization of Trans-Siberian Routes	Russian Federation
WP/10	2	Capacity Optimization on Cross-polar/Trans-East Routes	Russian Federation

INFORMATION PAPERS

NUMBER	AGENDA	TITLE	PRESENTED BY
IP/1	-	List of Working Papers (WPs) and Information Papers (IPs)	Secretariat
IP/2	2	Air India to Launch Non-stop Service to North America	IATA
IP/3	3	Final Report of the 13th Meeting of the Russian/American Coordinating Group for Air Traffic Control (RACGAT/13)	Secretariat
IP/4	2	ATS Route Proposals from IACA	IACA

…….

International Civil Aviation Organization

CMRI/3-WP/3
2/04/02

Third Special ATS Co-ordination Meeting – China, Mongolia, the Russian Federation & IATA (CMRI/3)

Beijing, China, 9-11 April 2002

Agenda Item 2: Discussions relating to operational improvements in the provision of air navigation services on ATS routes – Arctica-1 and Polar 1, 2, 3 and 4

CONSIDERATIONS TO CMRI ACTION ITEM 4: DEVELOP A SUITABLE FLIGHT PLAN PROCESS FOR CROSS-POLAR OPERATIONS

(Presented by the IATA)

SUMMARY

The following paper discusses airline flight planning requirements for cross-polar operations.

1. INTRODUCTION

1.1 The CMRI Task Force adopted an agreed task list on actions to be taken to further the development of the cross-polar track structure. Action Item 4, which is to "*develop a suitable flight plan process for cross-polar operations*" is the most important issue with airlines and is paramount to the successful implementation of the Cross-Polar routes between North America and Asia.

1.2 The following issues describe the critical requirements for flight planning cross-polar flights. These include:

a) air temperature,
b) upper winds,
c) radiation,
d) HF propagation,
e) suitable alternate airfields for ETOPS, and
f) flow control slots.

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

2. DISCUSSION

2.1 **Air temperature.** In the wintertime, arctic cells of high barometric pressure are characterised as masses of ultra cold air. For many airframes that fly cross-polar routes, too much exposure to the ultra cold air can lower the fuel temperature below its certified freezing point. Although the aircraft can raise the fuel temperature by descending into denser air or by increasing its air speed this is only a contingency procedure. However, airlines know in advance where the ultra cold air exists and can

flight plan a route that avoids unacceptable exposure to ultra cold temperatures. However, a route change for an ultra-long range operation can dramatically change the flight path resulting in a requirement to flight plan a new border crossing at the China FIR boundary.

2.2 **Upper Winds**. Studies have shown flight time differences between the cross-polar route options available for a given city pair to be as high as two hours, which means that a track normally flown for a given city pair could be an impossible option on the day of departure. Upper wind information is available at 0600 and 1800 UTC. Many times the difference even between 12 hours of upper wind data can significantly change the flight time en route. However, the current flight-planning procedures do not allow an airline to change their entry point into China, which costs the airline industry millions of dollars.

2.3 **Radiation**. Due to the rupture of the ozone blanket in the Polar Regions, exposure to radiation is another issue in flight planning. Too much radiation exposure carries a health risk. However, airlines do have access to daily information that allows them to avoid areas of excessive radiation. Again, this requires the aircraft to change its planned route of flight on the day of flight.

2.4 **HF Propagation**. Radiation storms in the polar region adversely affect HF propagation. When HF is unavailable there is no other means of air-ground communication, as geo-stationary or geo-synchronous satellites cannot provide communication above 80 degrees north. However, solar storms are known in advance and airlines could flight plan to avoid areas that may have unacceptable HF performance.

2.5 **ETOPS**. Cross-polar ETOPS operations require aircraft to be within 180 minutes of a suitable alternate aerodrome at all times. This means that all of the suitable alternates required to complete the ETOPS flight must have a weather report or forecast, or any combination thereof, which indicate that the weather conditions, will be at or above the required aerodrome operating minima, and the runway surface conditions indicate that a safe landing will be possible. This can only be determined on the day of flight.

2.6 **Flow control slots**. Although flow control is not an issue for cross-polar operations today, they are a reality for Russian Far East (RFE) operations and could be enforced for cross-polar operations if traffic numbers were to grow. If the RFE track advisory programme is expanded to include cross-polar operations, then a missed slot may require an aircraft to re-file a flight plan with a different route of flight and a different border crossing point into China.

3.0 OPTIONS

3.1 There are a couple of options that China should consider for allowing airlines to alter their flight plan to meet flight planning requirements. Although the examples cited concern flights in the context of CMRI, which addresses cross-polar operations to/from North America, the requirement applies for all long-range flights entering China, such as to/from Europe.

3.2 OPTION 1: Placing approved alternate routings in the repetitive flight plan is an option currently practised by many States. For example Russia allows up to 8 choices on the route of flight in the repetitive flight plan. This meets most, if not all, of the cross-polar flight planning needs in Russian airspace. If 3-4 route choices were available to the Chinese repetitive flight plan then most route scenarios would be covered. However, any change to the current single entry point requirement would significantly benefit airline operations.

3.2 OPTION 2: If only one route can be filed on a repetitive flight plan then a procedure could be established that would allow the airline to request a change to its route of flight. The airline would need the approval back from China at least 3 hours before departure. This means that the General

Dispatching Office would need to co-ordinate and obtain the approval approximately 14-16 hours before the flight would enter China's airspace.

4. **ACTION BY CMRI/3**

4.1 The meeting is invited to note:

- the airline legal requirements that are necessary for flight planning,
- the airline requirements necessary for safety and efficiency of flight,
- the airline requirements that are necessary before the cross-polar tracks can be marketable and suitable for day-to-day scheduled operations, and
- the options presented that could meet airline flight planning requirements.

---- END ----

ANCHORAGE GRL October 18, 2005 (Tuesday Departures)

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GATEWAY RESERVATION LIST (COMPILED 10/18/05 19:36) PAGE 1 OF 4

ANCHORAGE ARTCC
TRAFFIC MANAGEMENT
GATEWAY RESERVATION LIST

	=REQUESTED=				=RELEASED=			
	WHEEL	CROSS			WHEEL	CROSS		
	UP	FIX			UP	FIX	RELEASED	
FLIGHT	TIME	TIME	DEPT	DEST	TIME	TIME	ALT	TRK
FLIGHTS FOR TRACK N CROSSING FIX LISKI								
JAL9	1655	2326	KORD	RJAA	1655	2326	96	N
KAL094	1750	0052	KIAD	RKSI	1750	0052	96	N
NWA69	1955	0217	KDTW	RJBB	1955	0218	96	N
NWA71	2013	0235	KDTW	RJGG	2015	0238	96	N
ANA009	1645	2343	KJFK	RJAA	1700	2358	106	N
ANA001	1720	0008	KIAD	RJAA	1730	0018	106	N
KAL038	1805	0049	KORD	RKSI	1805	0049	106	N
NWA25	1840	0101	KDTW	RJAA	1848	0109	106	N
KAL036	1725	0109	KATL	RKSI	1745	0129	106	N
NWA11	1945	0207	KDTW	RJAA	1945	0207	106	N
NWA19	2025	0214	KMSP	RJAA	2038	0227	106	N
UAL877	1725	2352	KORD	RJBB	1725	2352	116	N
KAL082	1750	0052	KJFK	RKSI	1750	0052	116	N
DAL55	1630	0045	KATL	RJAA	1657	0112	116	N
FLIGHTS FOR TRACK P CROSSING FIX FRENK								
ACA029	1935	2325	CYVR	ZBAA	1955	2345	96	P
ACA001	1750	0031	CYYZ	RJAA	1759	0040	96	P
ACA039	2130	0121	CYVR	RJBB	2130	0121	96	P
ACA007	2145	0135	CYVR	VHHH	2151	0141	96	P
JAL47	1430	2131	KJFK	RJAA	1430	2131	106	P
JAL5	1750	0052	KJFK	RJAA	1750	0052	106	P

FLIGHTS FOR TRACK P2 CROSSING FIX DEVID

ACA015	1402	1939	CYYZ	VHHH	1402	1939	350	P2
ACA031	1424	2006	CYYZ	ZBAA	1424	2006	350	P2
THA791	1620	2230	KJFK	VTBD	1620	2230	350	P2

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FLIGHTS FOR TRACK P3 CROSSING FIX RAMEL

UAL895D	1410	1950	KORD	VHHH	1410	1950	340	P3
COA89	1630	2234	KEWR	ZBAA	1630	2234	340	P3
UAL895	1750	2317	KORD	VHHH	1750	2317	340	P3
UAL835	1755	2337	KORD	ZSPD	1755	2337	340	P3
UAL851	1930	0110	KORD	ZBAA	1930	0110	340	P3
CPA831	2010	0223	KJFK	VHHH	2010	0223	340	P3
CCA982	2100	0330	KJFK	ZBAA	2100	0330	340	P3
UAL829	2325	0504	KORD	VHHH	2325	0504	340	P3

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FLIGHTS FOR TRACK P4 CROSSING FIX ORVIT

UAL801	1709	2331	KJFK	RJAA	1709	2331	320	P4
COA9	1540	2200	KEWR	RJAA	1540	2200	340	P4
UAL881D	1627	2220	KORD	RJAA	1627	2220	340	P4
UAL881	1737	2331	KORD	RJAA	1738	2332	340	P4
UAL883	1836	0033	KORD	RJAA	1836	0033	340	P4

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FLIGHTS FOR TRACK Q CROSSING FIX YUREE

UPS6880	1614	1734	PANC	RJAA	1614	1734	96	Q
UPS6830	1639	1802	PANC	RJBB	1639	1802	96	Q
UPS6991	1842	2002	PANC	VHHH	1842	2002	96	Q
FDX13	1901	2025	PANC	RKSI	1901	2025	96	Q
FDX19	1942	2106	PANC	RJBB	1942	2106	96	Q
ACA035	1930	2325	CYVR	RJBB	1930	2325	96	Q
CCA992	2020	0015	CYVR	ZBAA	2020	0020	96	Q
UPS6928	1712	1830	PANC	ZSPD	1712	1830	106	Q
UPS6940	1716	1836	PANC	VHHH	1730	1850	106	Q
UPS6995	1747	1904	PANC	RKSI	1753	1910	106	Q
UPS6972	1847	2003	PANC	ZGGG	1847	2003	106	Q
ACA037	1935	2310	CYVR	ZSPD	1935	2310	106	Q
ACA063	1950	2340	CYVR	ZSPD	1945	2340	106	Q
COA7	1620	2355	KIAH	RJAA	1633	0008	106	Q
AAL167	1705	0022	KJFK	RJAA	1711	0028	106	Q
UAL889	2059	0156	KSFO	ZBAA	2059	0156	106	Q
KAL232	1500	1614	PANC	RKSI	1500	1614	116	Q
KAL258	1545	1659	PANC	RKSI	1545	1659	116	Q
N809C	2200	2325	PANC	ZBAA	2200	2325	116	Q

AAL153	1625	2349	KORD	RJAA	1653	2349	116	Q
KAL032	1750	0054	KDFW	RKSI	1750	0054	116	Q
AAL27	1810	0110	KORD	RJGG	1814	0114	116	Q
KAL026	2120	0125	KSEA	RKSI	2129	0134	116	Q
SIA015	2135	0231	KSFO	RKSI	2135	0231	116	Q

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FLIGHTS FOR TRACK R CROSSING FIX MARCC

ACA009	2030	0104	CYVR	RJGG	2030	0104	96	R
ACA003	2030	0058	CYVR	RJAA	2030	0058	106	R

ANALYSIS OF ABOVE ADVISORY

NUMBER OF FLIGHTS PUT INTO PROGRAM: 62
NUMBER OF FLIGHTS SCHEDULED ON-TIME: 45
NUMBER OF FLIGHTS SCHEDULED WITH DELAY: 17
MINIMUM DELAY: 1 MAXIMUM DELAY: 27
AVERAGE DELAY TIME: 10.8

ANCHORAGE GRL October 15, 2005 (Saturday Departures)

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.ANCDPXA 151618
GATEWAY RESERVATION LIST (COMPILED 10/15/05 15:31) PAGE 1 OF 3

ANCHORAGE ARTCC
TRAFFIC MANAGEMENT
GATEWAY RESERVATION LIST

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	UP	FIX			UP	FIX	RELEASED	
FLIGHT	TIME	TIME	DEPT	DEST	TIME	TIME	ALT	TRK
FLIGHTS FOR TRACK N CROSSING FIX LISKI								
ANA009	1650	2352	KJFK	RJAA	1650	2352	96	N
KAL038	1810	0053	KORD	RKSI	1810	0053	96	N
KAL082	1755	0105	KJFK	RKSI	1803	0113	96	N
NWA69	1952	0234	KDTW	RJBB	1952	0234	96	N
JAL47	1440	2132	KJFK	RJAA	1440	2132	106	N
COA9	1540	2227	KEWR	RJAA	1540	2227	106	N
ANA001	1635	0000	KIAD	RJAA	1635	0000	106	N
UAL801	**1655**	**0000**	**KJFK**	**RJAA**	**1715**	**0020**	**106**	**N** **<<<<<<<UAL801**
UAL877	1727	0005	KORD	RJBB	1802	0040	106	N
ACA001	1745	0038	CYYZ	RJAA	1807	0100	106	N
KAL094	1755	0114	KIAD	RKSI	1801	0120	106	N
NWA25	1840	0128	KDTW	RJAA	1852	0140	106	N
NWA19	2020	0208	KMSP	RJAA	2020	0208	106	N
NWA11	1945	0230	KDTW	RJAA	1945	0230	106	N
NWA3	2035	0223	KMSP	RJAA	2047	0250	106	N
NWA71	2010	0252	KDTW	RJGG	2028	0310	106	N
JAL5	1800	0052	KJFK	RJAA	1800	0052	116	N
FLIGHTS FOR TRACK P2 CROSSING FIX DEVID								
THA791	1620	2224	KJFK	VTBD	1620	2224	350	P2
UAL835	1742	0000	KORD	ZSPD	1742	0000	350	P2
CPA831	2010	0220	KJFK	VHHH	2010	0220	350	P2
FLIGHTS FOR TRACK P3 CROSSING FIX RAMEL								
UAL851	1730	2345	KORD	ZBAA	1730	2345	340	P3
CCA982	2100	0330	KJFK	ZBAA	2100	0330	340	P3

FLIGHTS FOR TRACK Q CROSSING FIX YUREE

KAL232	1500	1618	PANC	RKSI	1500	1618	96	Q
KAL258	1545	1703	PANC	RKSI	1545	1703	96	Q
CKK226	2015	2134	PANC	ZBAA	2015	2134	96	Q
CCA9006	1605	1750	PANC	ZBAA	1605	1750	106	Q
AAR297	1835	1955	PANC	RKSI	1835	1955	106	Q
UPS6928	1857	2016	PANC	ZSPD	1857	2016	106	Q
FDX155	1916	2032	PANC	RKSI	1920	2036	106	Q
UPS6972	2117	2234	PANC	ZGGG	2117	2234	106	Q
AAL167	1557	2317	KJFK	RJAA	1557	2317	106	Q
ACA029	1935	2339	CYVR	ZBAA	1935	2339	106	Q
AAR271	2030	0058	KSEA	RKSI	2030	0058	106	Q
SIA017	2120	0126	CYVR	RKSI	2120	0126	106	Q
KAL026	2120	0146	KSEA	RKSI	2120	0146	106	Q
CCA986	2140	0230	KSFO	ZBAA	2140	0230	106	Q
UAL889	2059	0234	KSFO	ZBAA	2115	0250	106	Q
KAL032	1755	0053	KDFW	RKSI	1755	0053	116	Q
KAL036	1725	0123	KATL	RKSI	1725	0123	116	Q

ANALYSIS OF ABOVE ADVISORY

NUMBER OF FLIGHTS PUT INTO PROGRAM: 39
NUMBER OF FLIGHTS SCHEDULED ON-TIME: 29
NUMBER OF FLIGHTS SCHEDULED WITH DELAY: 10
MINIMUM DELAY: 4 MAXIMUM DELAY: 35
AVERAGE DELAY TIME: 15.3

SCM POLAR & RTE
APPENDIX F TO THE REPORT

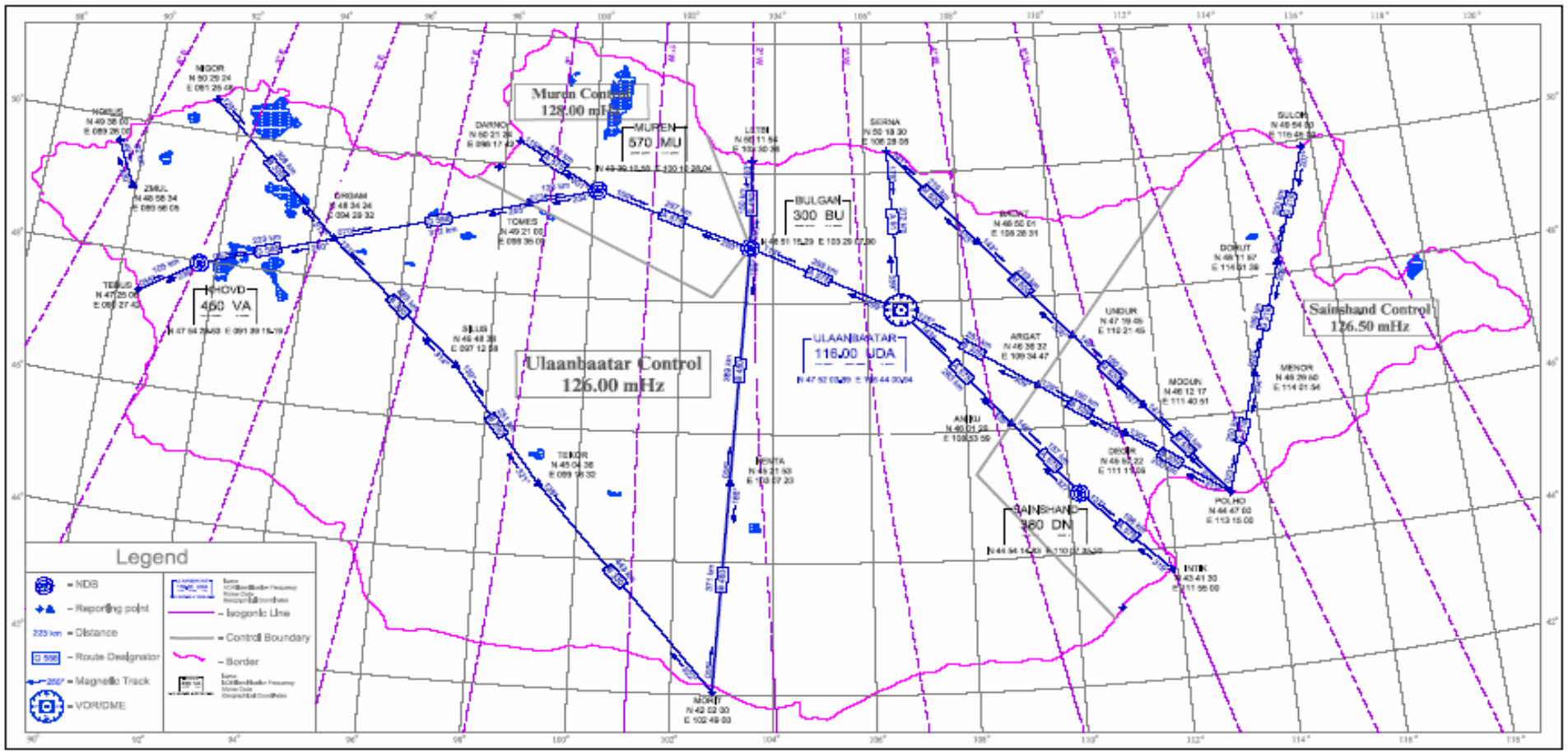
Air traffic flow over Mongolian airspace

International air routes in Mongolia

- The international air routes are:
  - A575
  - A91
  - M520
  - B339
  - G588
  - B330 - ASIA 1 Route
  - G218
  - B480

  } - Polar routes

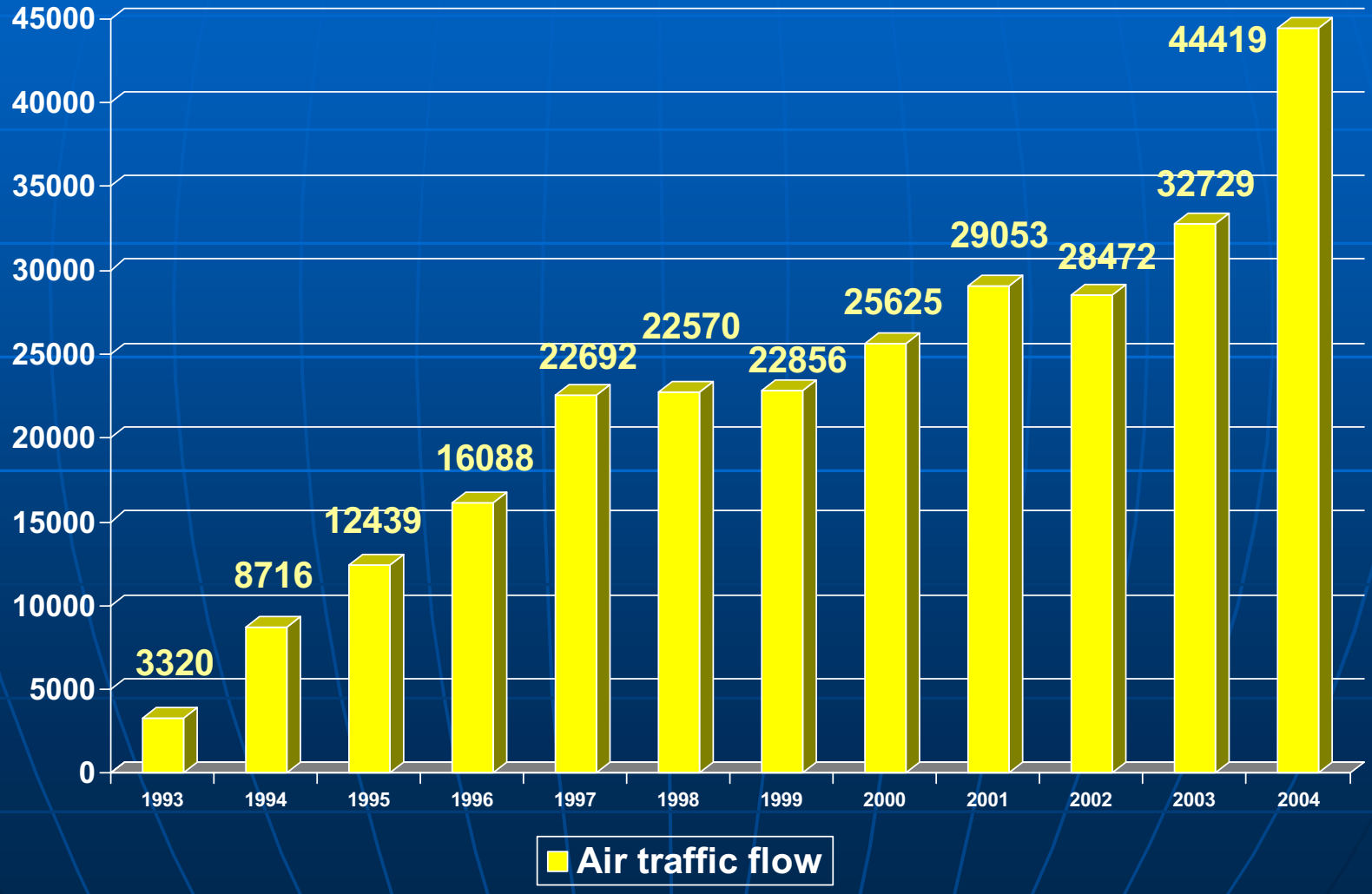
Air routes over Mongolia



CAA of MONGOLIA

Air traffic flow

(shown from 1993 to 2004)

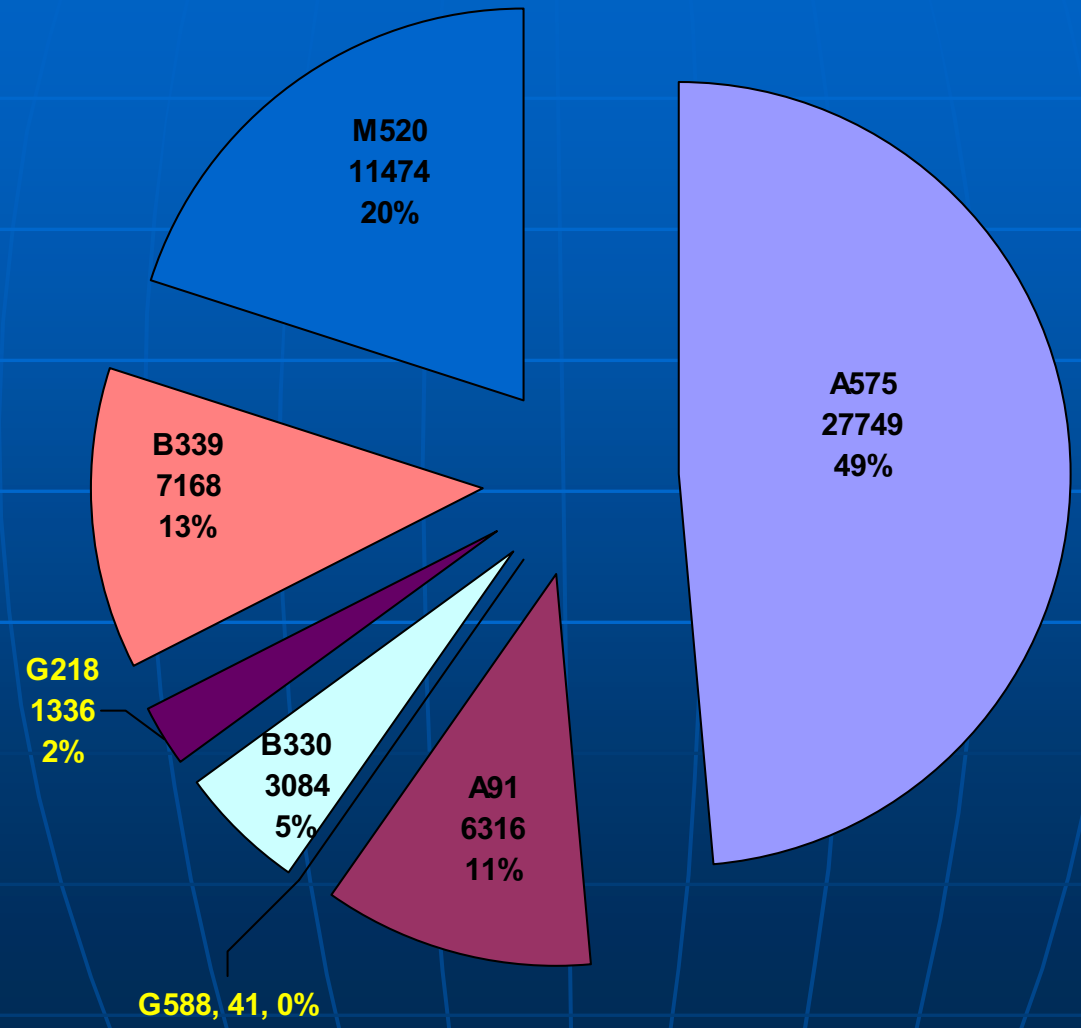


Flight density

- A575 49%
- M520 20%
- A91 11%
- B339 13%
- B330 5%
- G218 2%

- Over G588 operated only several flights.
- B480, only TG flights are operating on the air route.

Traffic density (2004 year)



Proposed ATS route parallel to the A575

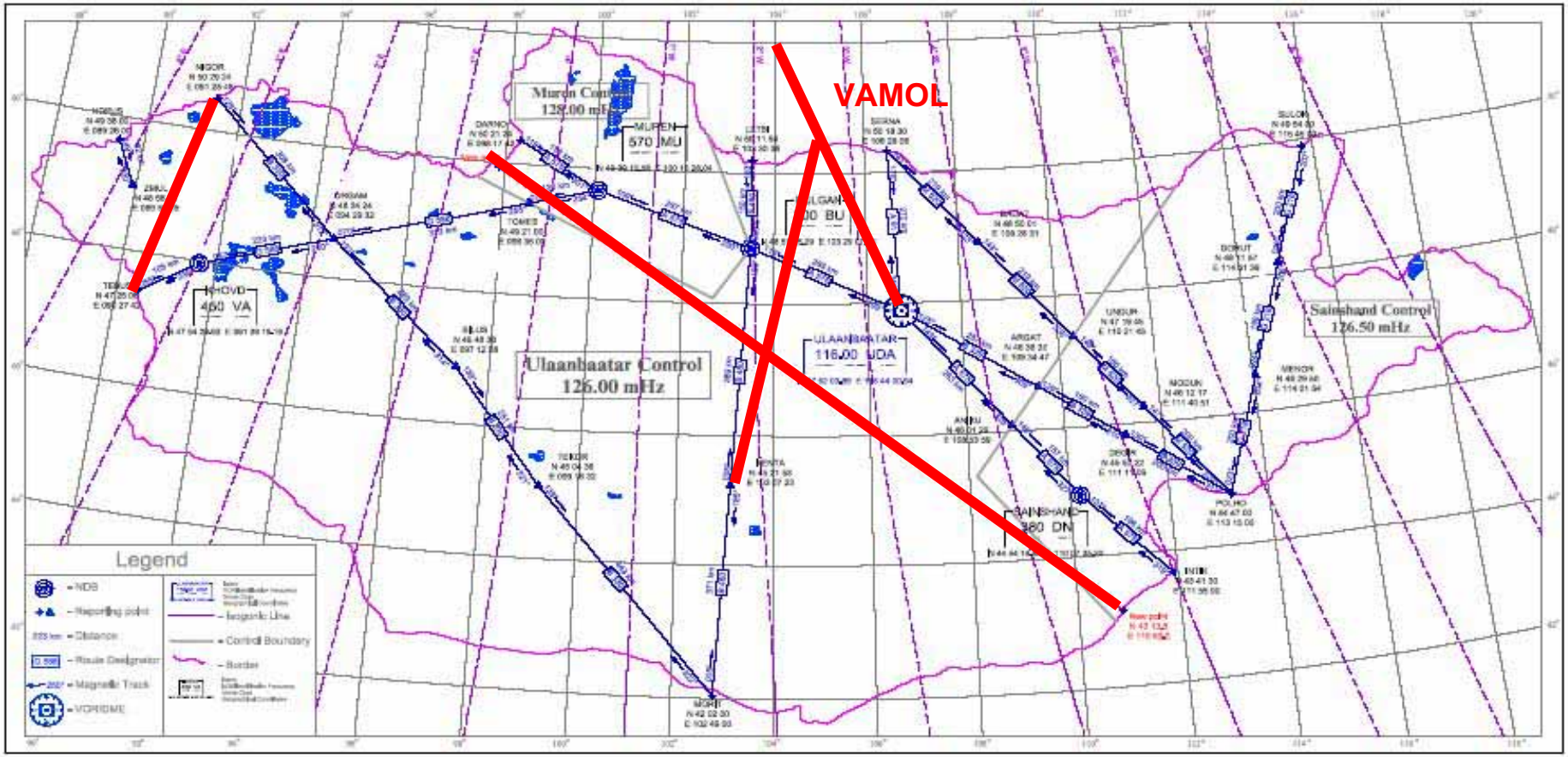
- The existing air route A575 is the main air route and 49% of all international flights are operated through A575.

- The air route faces problems due to following issues:
  - All outgoing flights (except Polar 3 traffic) from Mongolia to China are required to use this air route. The air route is joined by B339 and A91,
  - Number of flights during peak our exceeds ATC workload requirements set by MCAA,
  - Requirements of flight level change to transfer flights into Chinese airspace,
  - No surveillance system is available, and
  - Expect peak traffic during Beijing Olympics in 2008.

- Mongolia has proposed to China and Russia to open a parallel air route to the A575. This proposal was provisionally accepted by Russian Federation to open a new Entry/Exit point next to DARNO. The proposal is being discussed with China during several meetings with CAAC.

Proposed ATS routes

PROPOSED ATS ROUTE



CAA of MONGOLIA

About polar routes

- B480 is just started to be used for over flights between North America & South Asia.
- There is need to open new entry/exit point VAMOL and connect to existing air routes.

Bayarlalaa

ЗОНА ОТВЕТСТВЕННОСТИ ЦЕНТРОВ ЕС ОрВД РОССИЙСКОЙ ФЕДЕРАЦИИ

ЗОНА ОТВЕТСТВЕННОСТИ СОСТАВЛЯЕТ 25 млн. кв. км

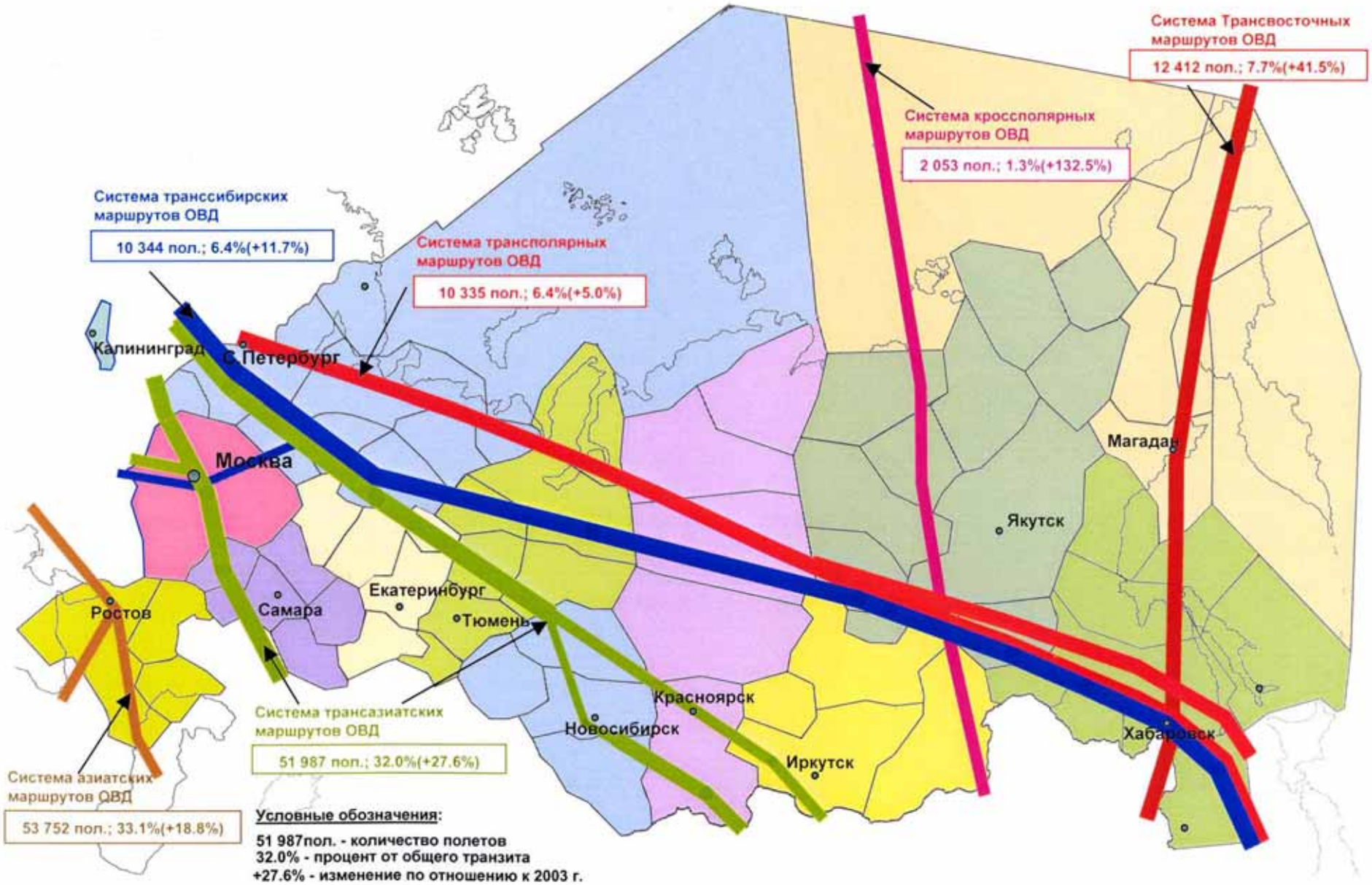
ОРГАНИЗАЦИЮ ВОЗДУШНОГО ДВИЖЕНИЯ ОСУЩЕСТВЛЯЮТ 113 ЦЕНТРОВ ЕС ОРВД:

- ЗЦ ЕС ОрВД - 8
- ВЗЦ ЕС ОрВД - 4
- РЦ ЕС ОрВД - 62
- ВРЦ ЕС ОрВД - 39

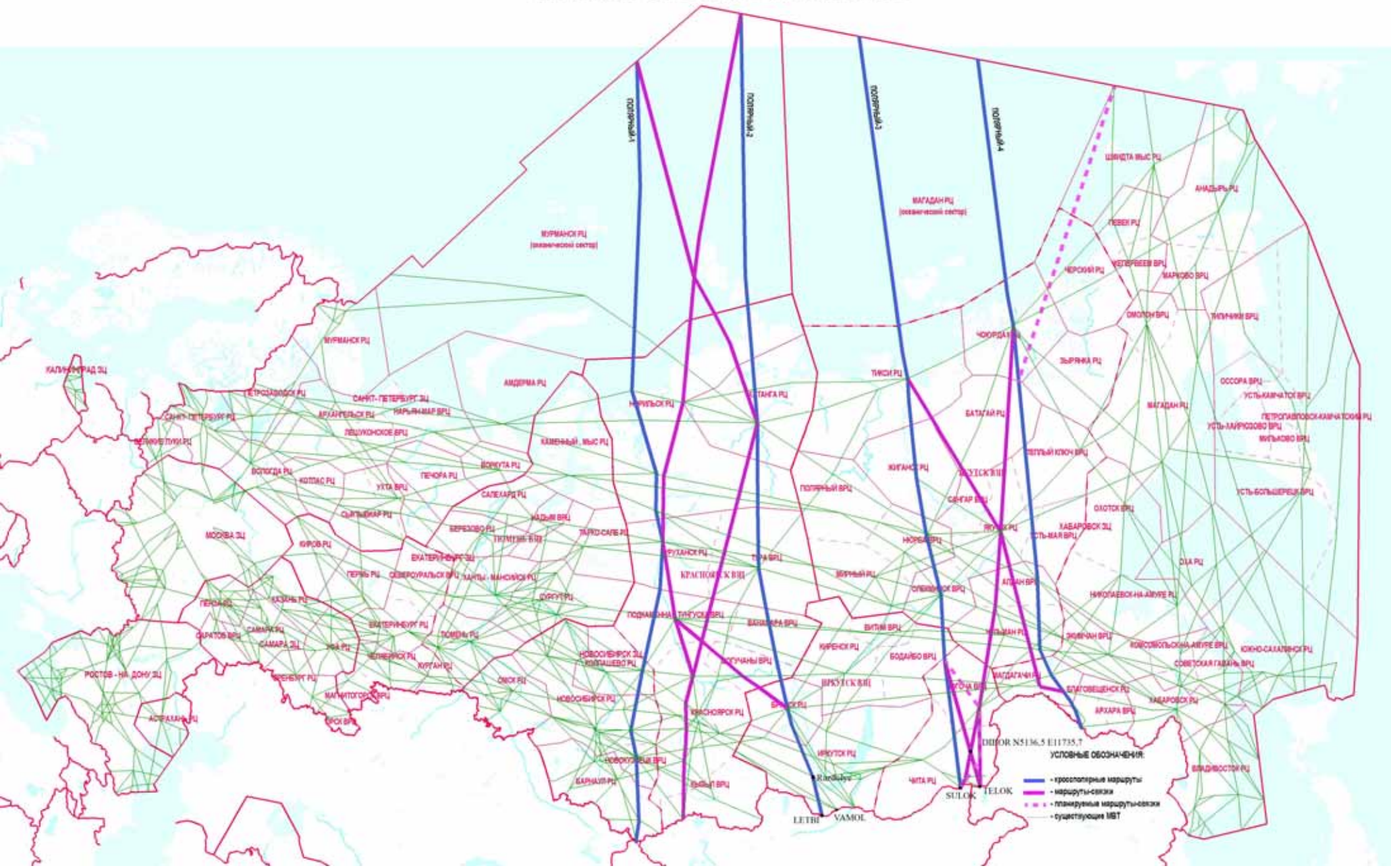
ВЫПОЛНЯЮТ ПОЛЕТЫ:

ВСЕГО - 986 АВИАКОМПАНИЙ
ИЗ НИХ ОТЕЧЕСТВЕННЫХ - 220
ИНОСТРАННЫХ - 766

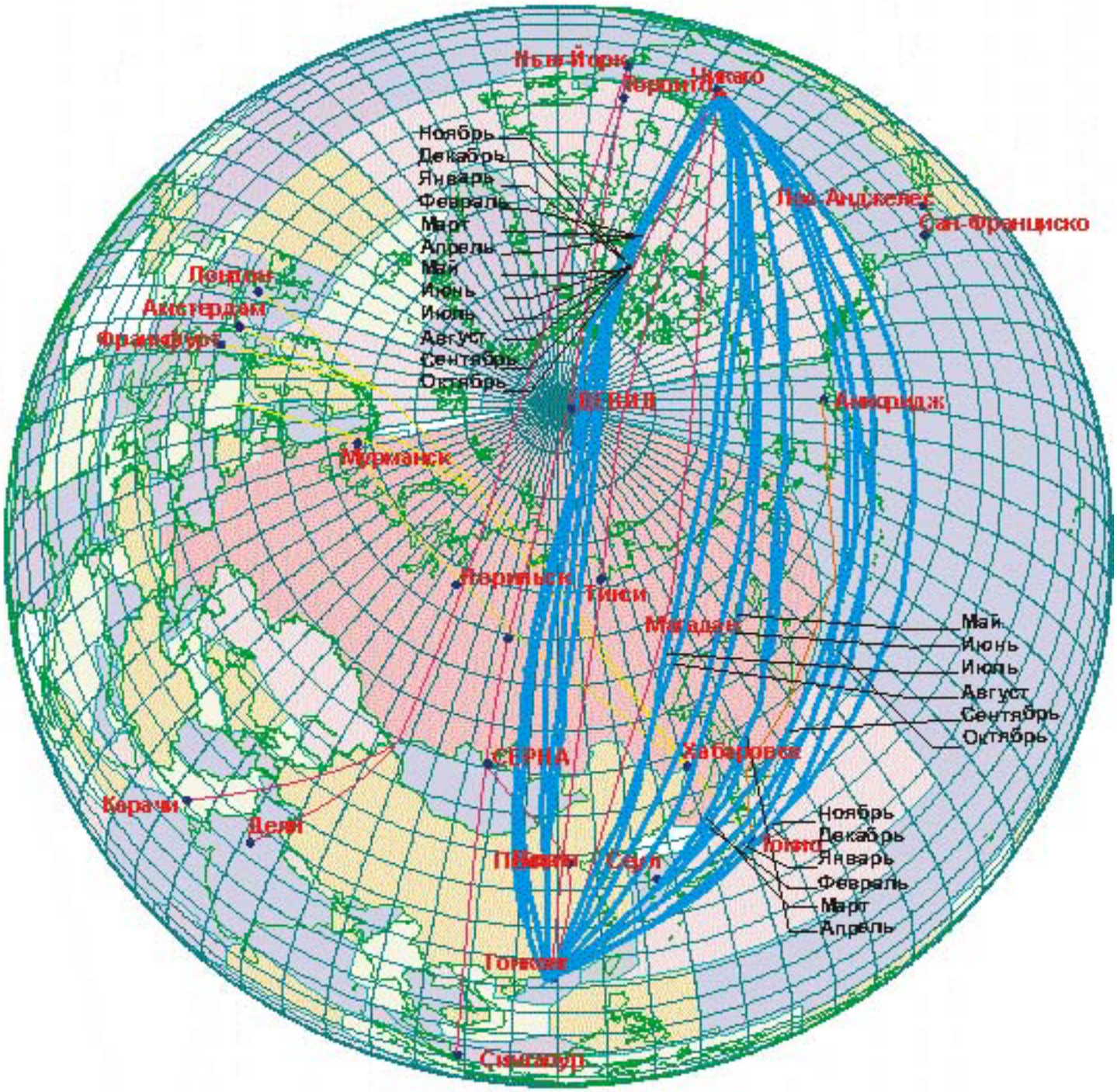
Основные транзитные самолетопотоки в воздушном пространстве России в 2004 году



СИСТЕМА КРОССПОЛЯРНЫХ МАРШРУТОВ



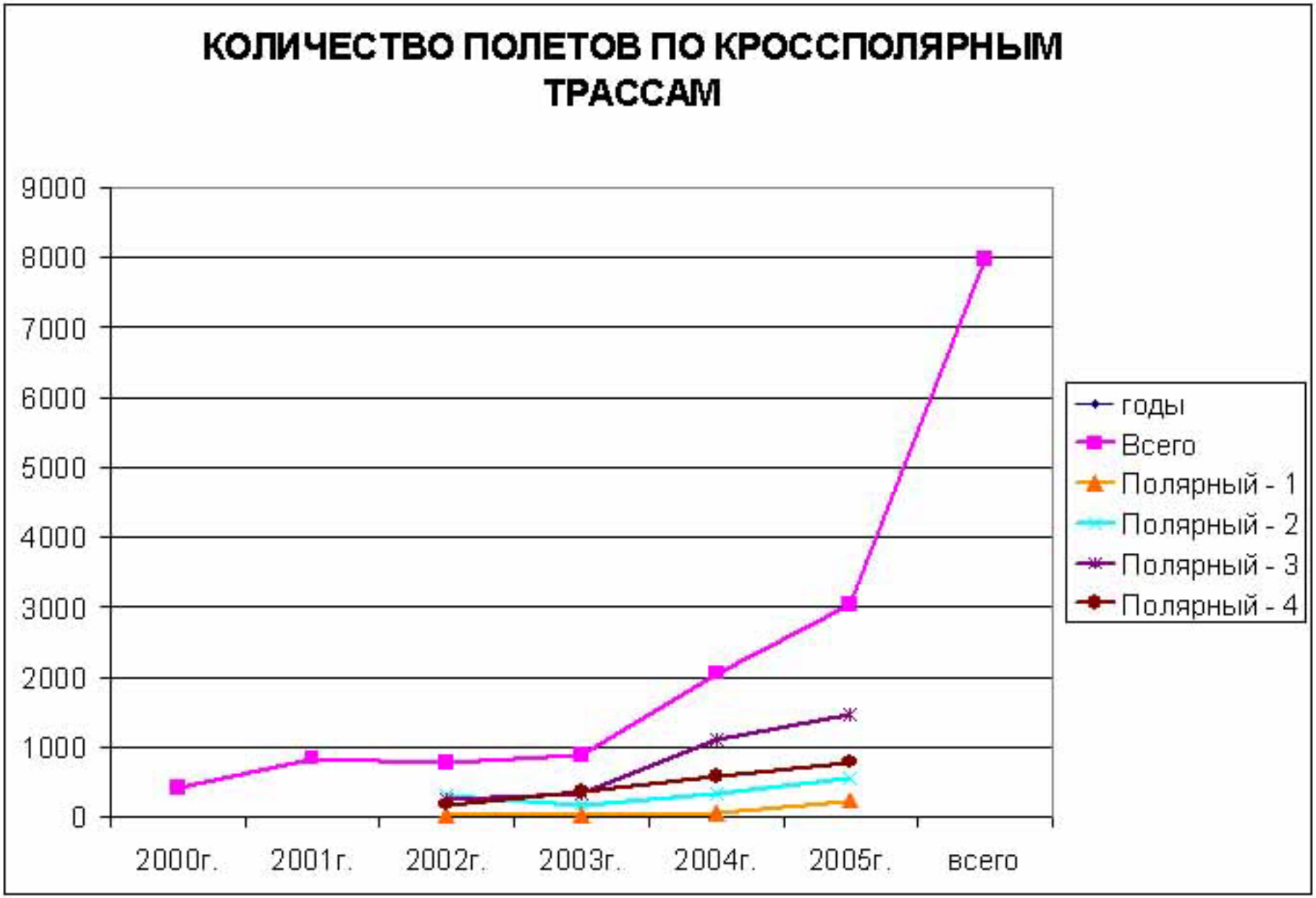
Кратчайшие треки по месяцам между парой городов Чикаго-Гонконг

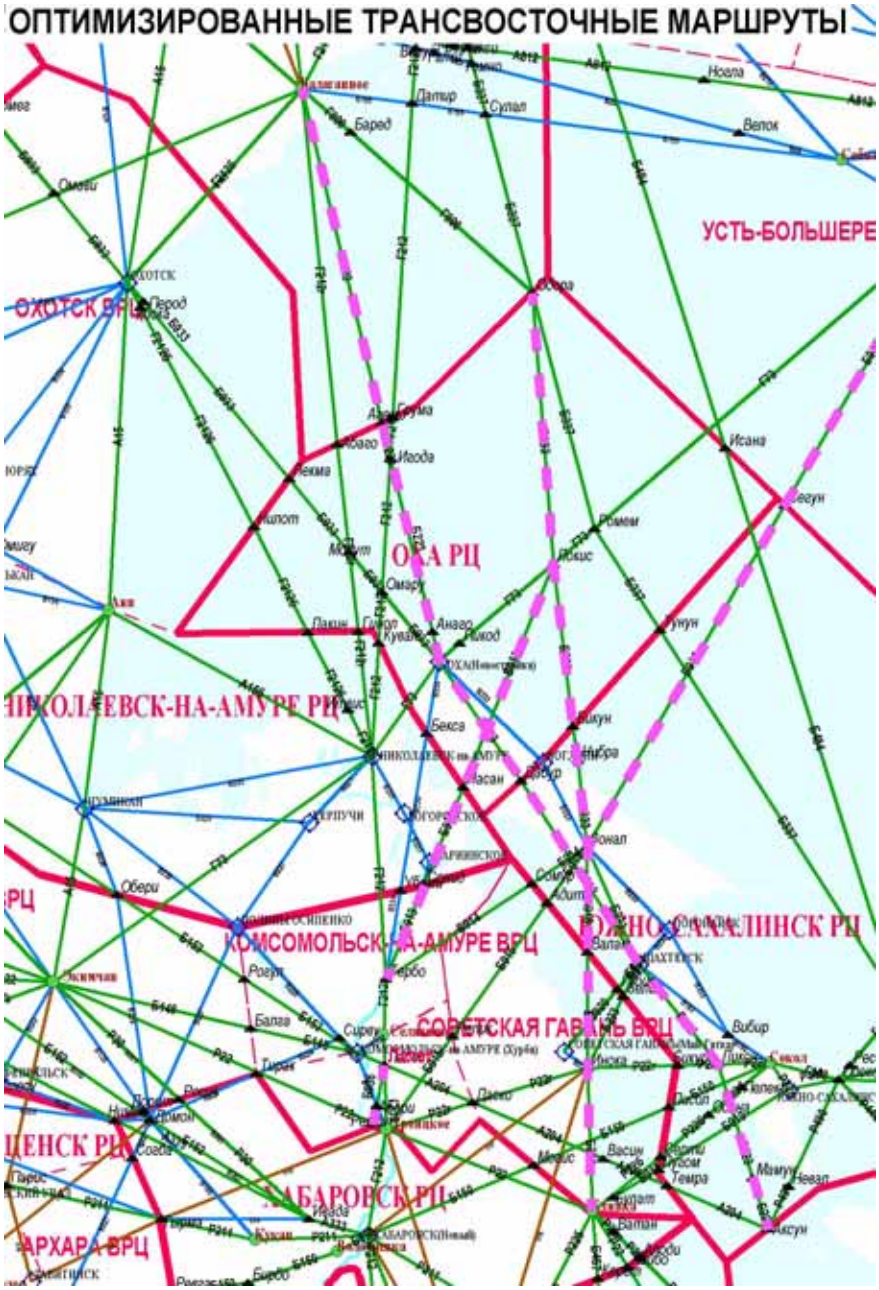


Действующее расстояние: **7787м.миль**

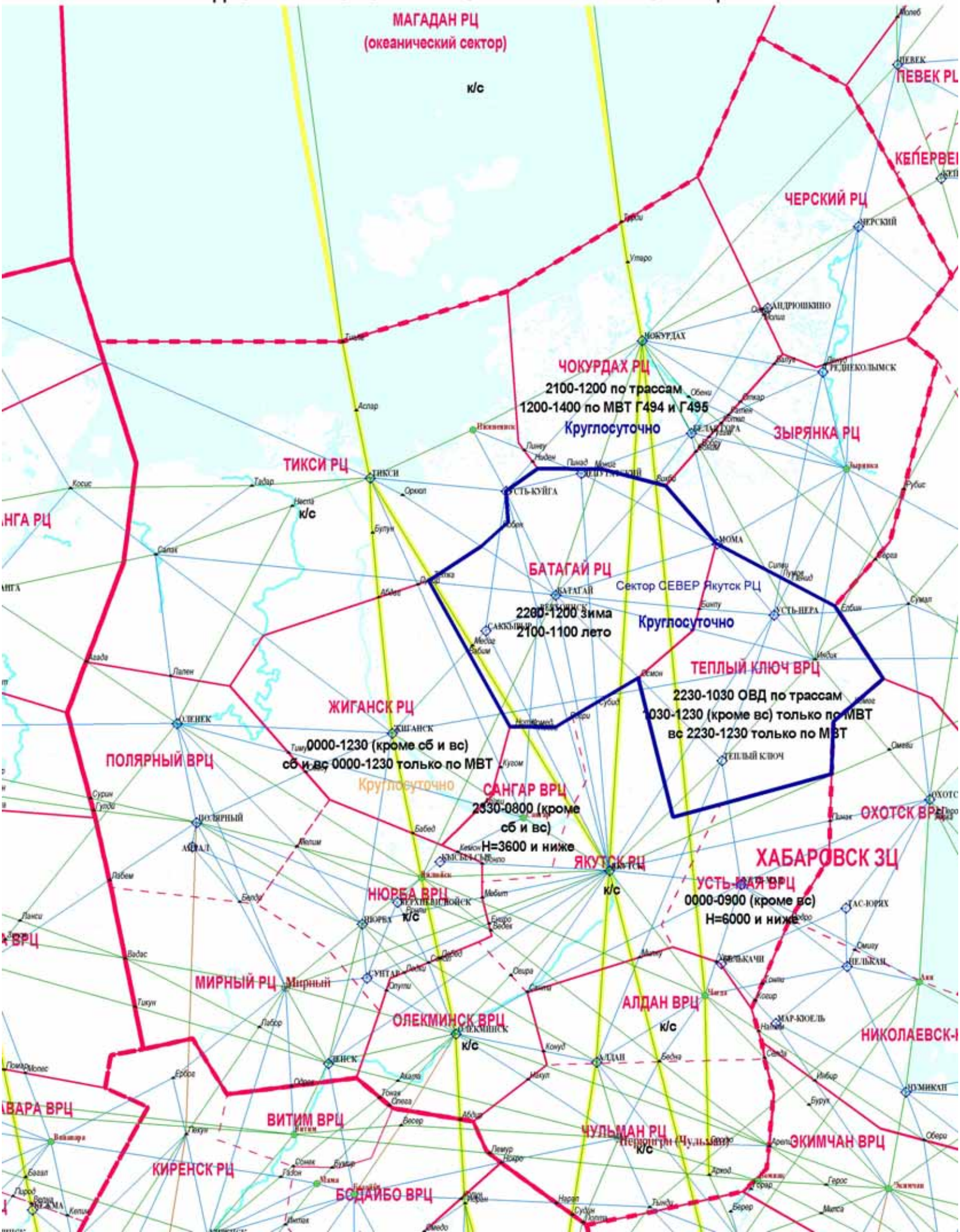
Расстояние по Кроссполярному маршруту: **6753м.миль**

Экономия за один полет **1034м.миль 2 часа 15 мин.**


КОЛИЧЕСТВО ПОЛЕТОВ ПО КРОССПОЛЯРНЫМ ТРАССАМ
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
2000г.
2001г.
2002г.
2003г.
2004г.
2005г.
всего
годы
Всего
Полярный - 1
Полярный - 2
Полярный - 3
Полярный - 4

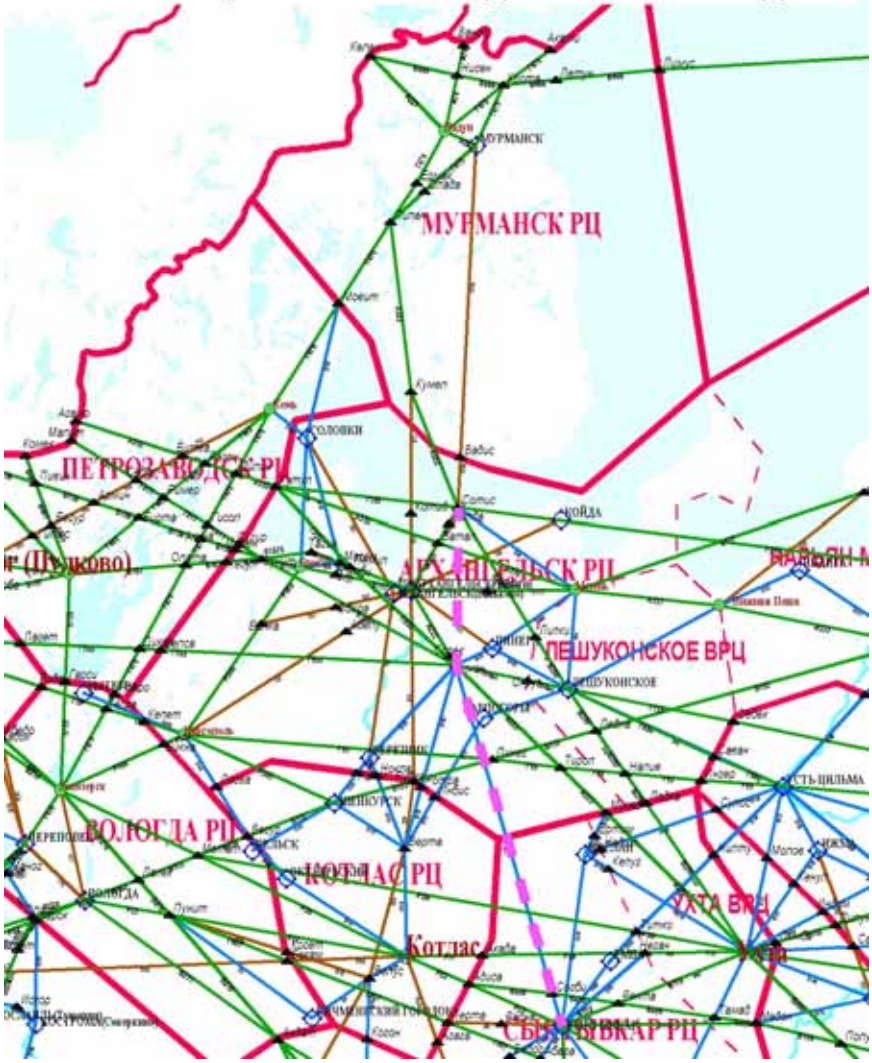

ОПТИМИЗИРОВАННЫЕ ТРАНСВОСТОЧНЫЕ МАРШРУТЫ
УСТЬ-БОЛЬШЕРЕ
ОХОТСК ВРЦ
ОЛА РЦ
НИКОЛАЕВСК-НА-АМУРЕ РЦ
КОМСОМОЛЬСК-НА-АМУРЕ ВРЦ
ЮЖНО-САХАЛИНСК РЦ
СОВЕТСКАЯ ГАВАНЬ ВРЦ
ХАБАРОВСК РЦ
АРХАРА ВРЦ

ПРЕДЛОЖЕНИЯ ПО ИЗМЕНЕНИЮ РЕГЛАМЕНТА РАБОТЫ РЦ

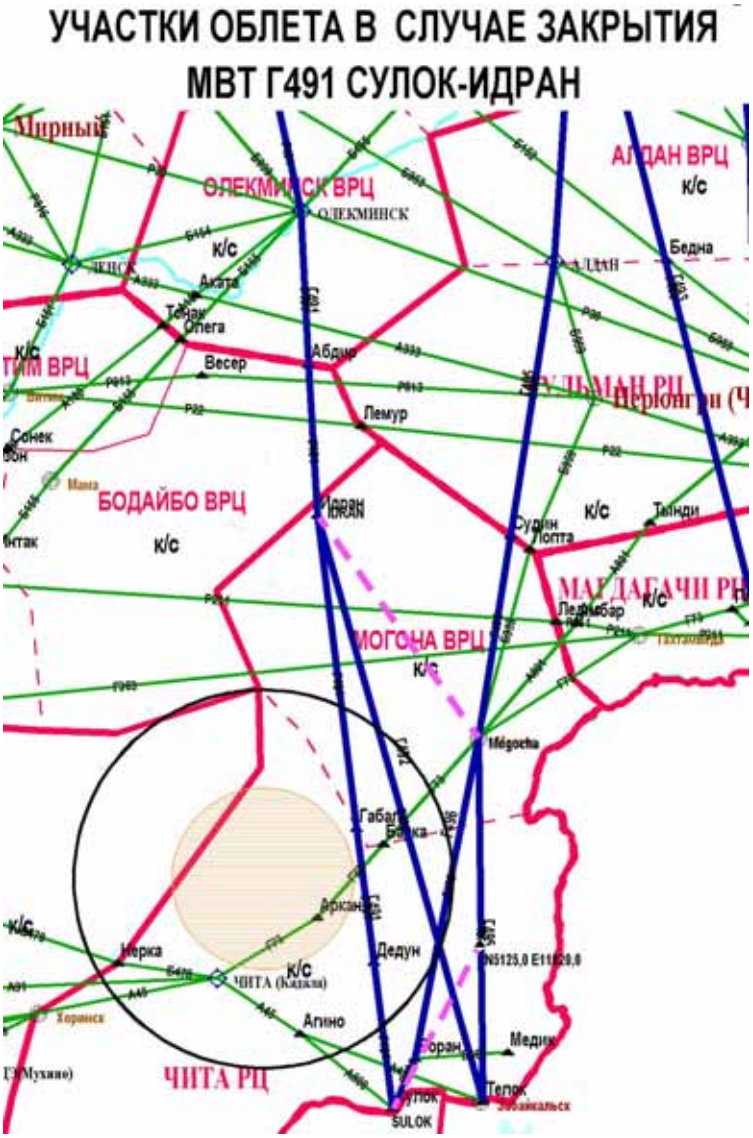


ПРЕДЛОЖЕНИЯ ПО ОПТИМИЗАЦИИ КРОССПОЛЯРНЫХ МАРШРУТОВ

ОПТИМИЗАЦИЯ МАРШРУТА ДЛЯ ПОЛЕТА НА ДЕЛИ

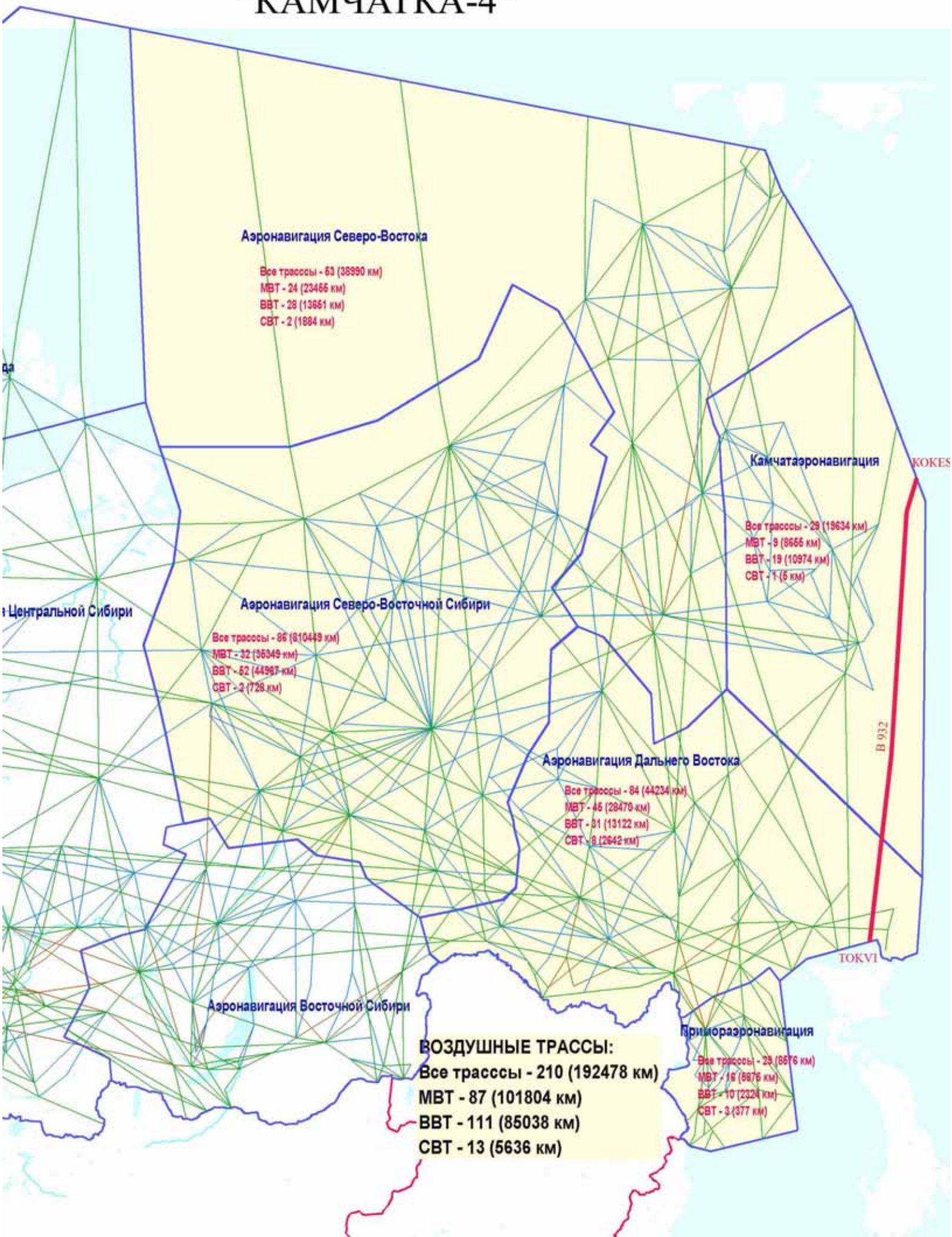


УЧАСТКИ ОБЛЕТА В СЛУЧАЕ ЗАКРЫТИЯ МВТ Г491 СУЛОК-ИДРАН

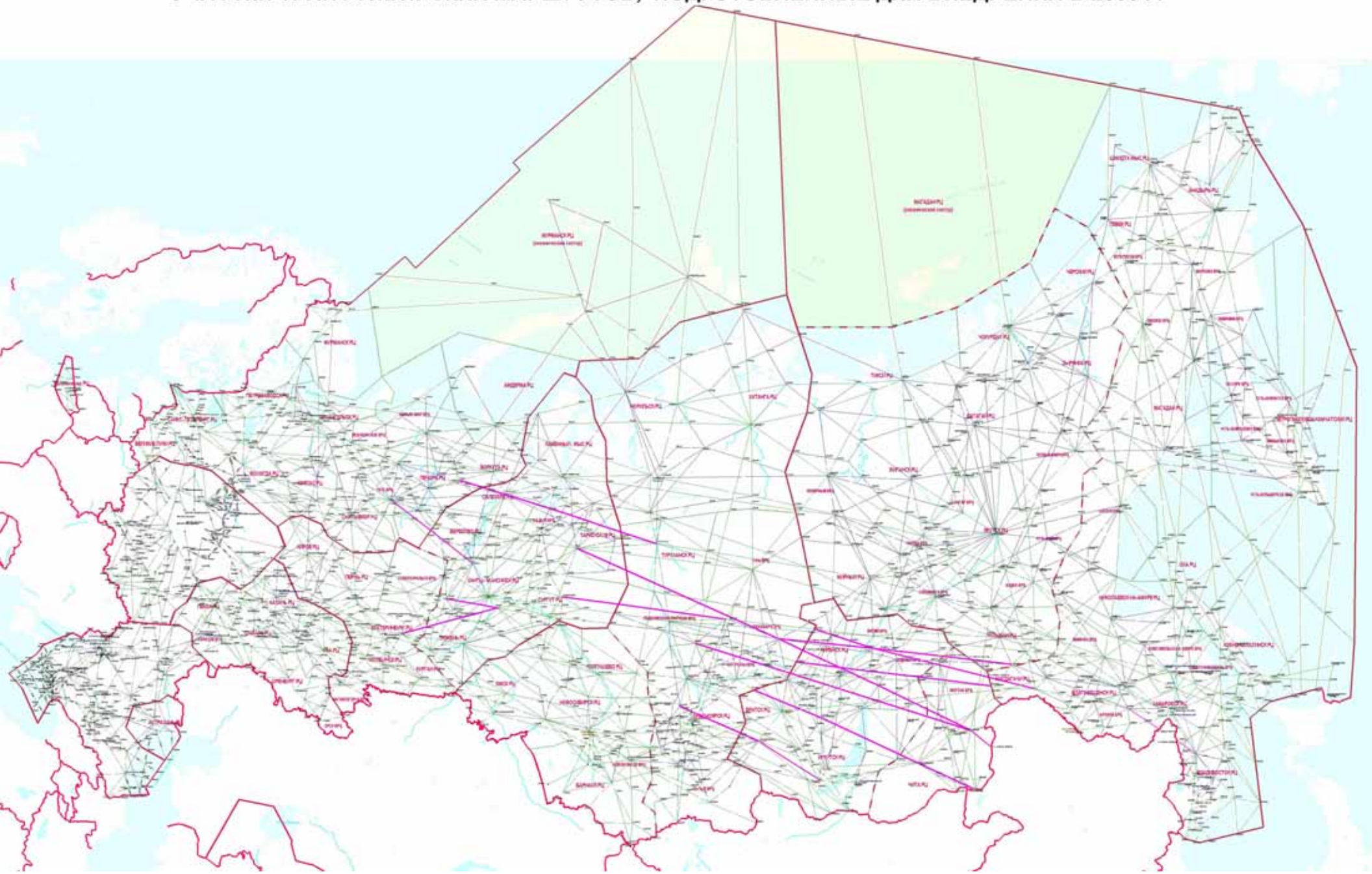


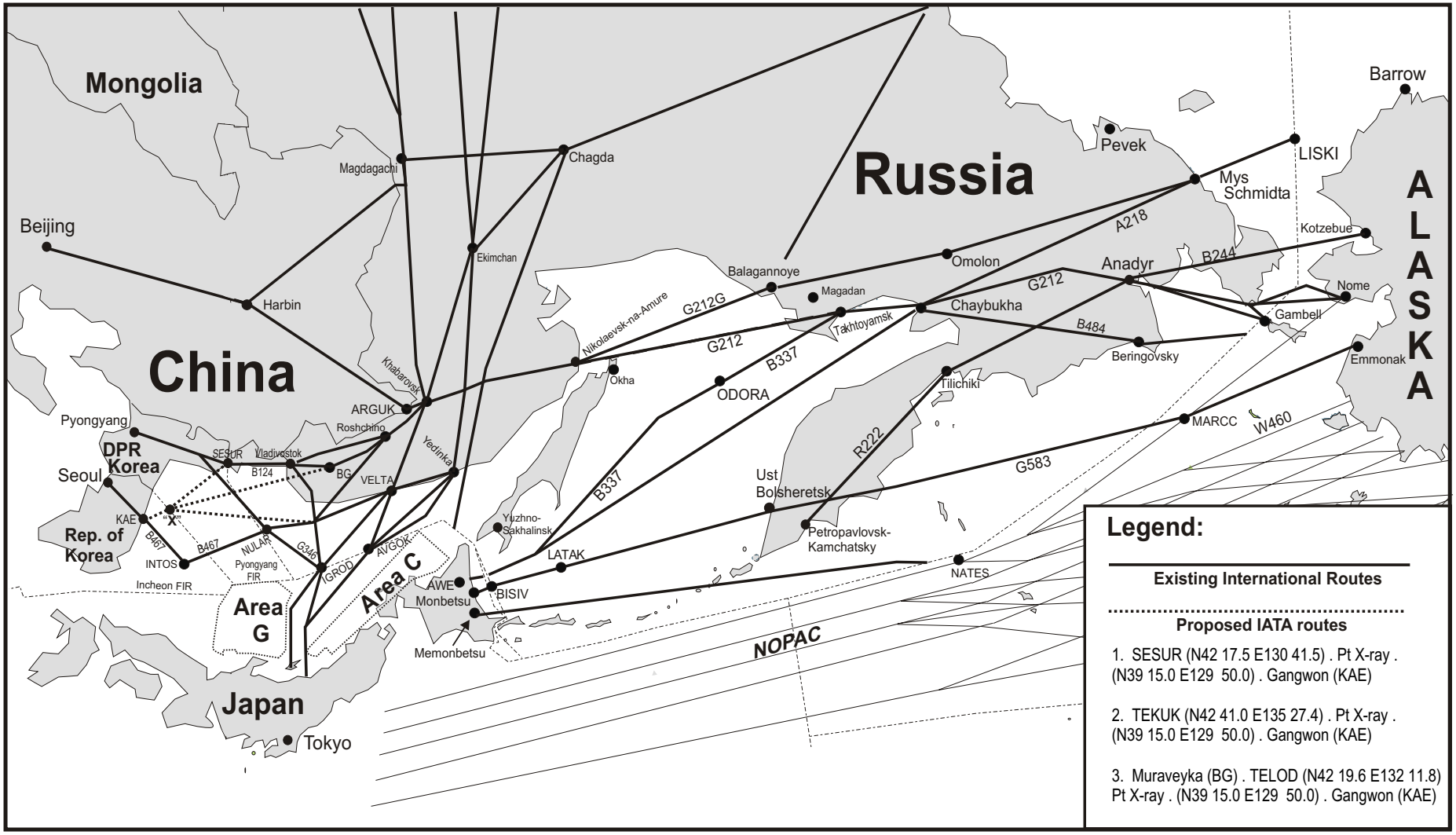
ДОПОЛНИТЕЛЬНЫЕ ПУНКТЫ НЕОБЯЗАТЕЛЬНОГО ДОНЕСЕНИЯ

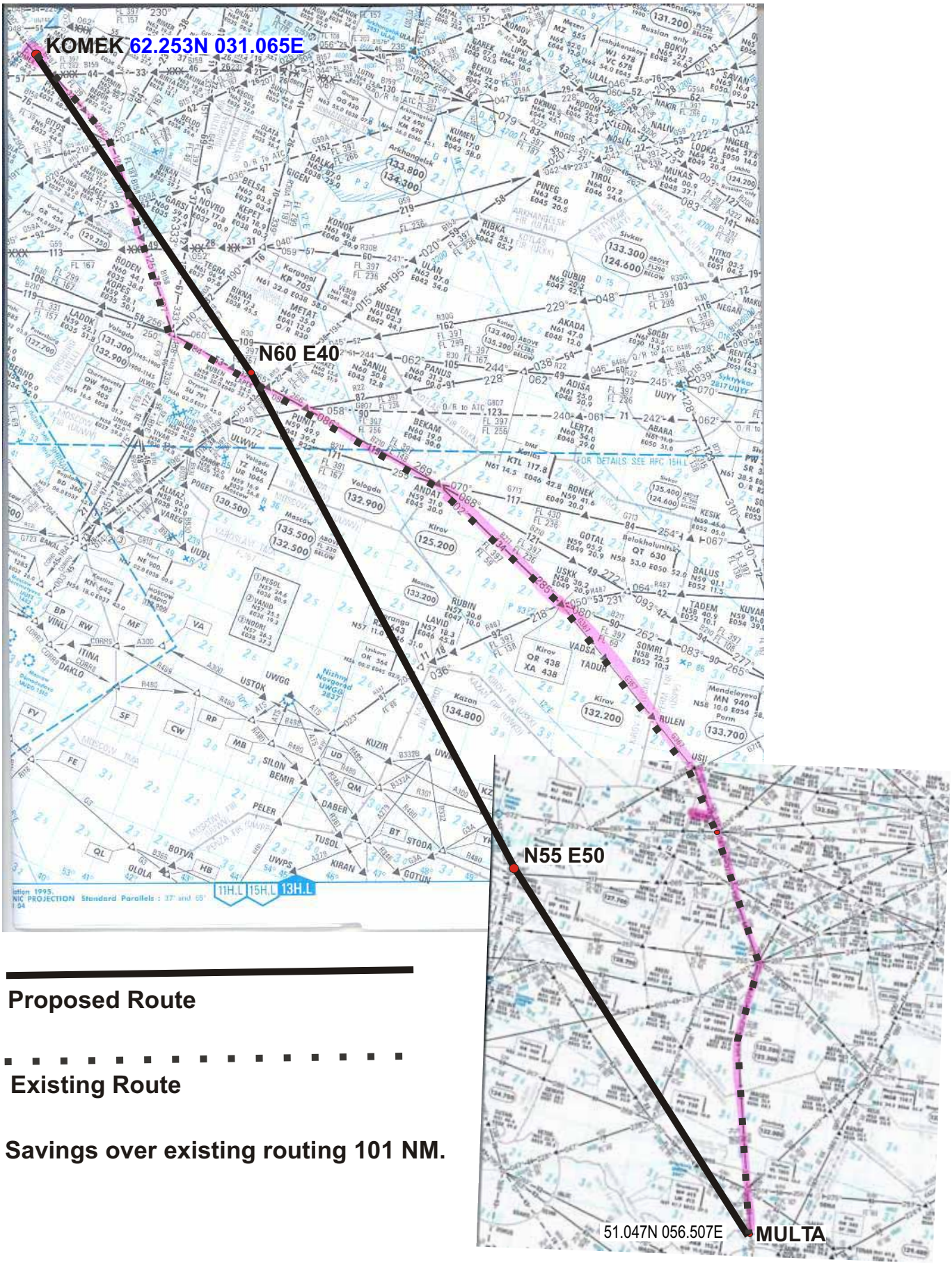
“КАМЧАТКА-4”


Аэронавигация Северо-Востока
Все трассы - 63 (38990 км)
МВТ - 24 (23466 км)
ВВТ - 28 (13661 км)
СВТ - 2 (1884 км)
Камчатаэронавигация
Все трассы - 29 (19634 км)
МВТ - 9 (8666 км)
ВВТ - 19 (10974 км)
СВТ - 1 (5 км)
KOKES
Аэронавигация Северо-Восточной Сибири
Все трассы - 86 (810449 км)
МВТ - 32 (36349 км)
ВВТ - 52 (44967 км)
СВТ - 2 (728 км)
Аэронавигация Дальнего Востока
Все трассы - 84 (44234 км)
МВТ - 46 (28479 км)
ВВТ - 31 (13122 км)
СВТ - 6 (2642 км)
B 932
TOKVI
Аэронавигация Восточной Сибири
Приморaэронавигация
Все трассы - 25 (8676 км)
МВТ - 16 (5876 км)
ВВТ - 10 (2324 км)
СВТ - 3 (377 км)
ВОЗДУШНЫЕ ТРАССЫ:
Все трасссы - 210 (192478 км)
МВТ - 87 (101804 км)
ВВТ - 111 (85038 км)
СВТ - 13 (5636 км)

УЧАСТКИ ТРАНССИБИРСКИХ МАРШРУТОВ, ПОДГОТОВЛЕННЫЕ ДЛЯ ВНЕДРЕНИЯ В 2006 Г.




Mongolia
Russia
China
Japan
ALASKA
Barrow
Pevek
LISKI
Mys Schmidta
Kotzebue
Anadyr
Nome
Gambell
Emmonak
Beringovsky
Chaybukha
Omolon
Magadan
Balagannoye
Takhtoyamsk
Nikolaevsk-na-Amure
Okha
Khabarovsk
Chagda
Magdagachi
Ekimchan
Harbin
Beijing
Tilichiki
Ust Bolsheretsk
Petropavlovsk-Kamchatsky
Yuzhno-Sakhalinsk
Pyongyang
DPR Korea
Seoul
Rep. of Korea
Roshchino
Vladivostok
Yedinka
ARGUK
SESUR
B124
BG
VELTA
KAE
X
INTOS
B467
NULAR
G346
GROD
AVGOK
Pyongyang FIR
Incheon FIR
Area G
Area C
AWE
Monbetsu
Memonbetsu
BISIV
LATAK
NATES
ODORA
MARCC
W460
R222
G583
B337
G212
G212G
A218
B244
B484
NOPAC
Legend:
Existing International Routes
Proposed IATA routes
1. SESUR (N42 17.5 E130 41.5) . Pt X-ray . (N39 15.0 E129 50.0) . Gangwon (KAE)
2. TEKUK (N42 41.0 E135 27.4) . Pt X-ray . (N39 15.0 E129 50.0) . Gangwon (KAE)
3. Muraveyka (BG) . TELOD (N42 19.6 E132 11.8) Pt X-ray . (N39 15.0 E129 50.0) . Gangwon (KAE)



Proposed Route

Existing Route

Savings over existing routing 101 NM.

Proposal for amendment of the route structure in Urumqi, Lanzhou, Beijing, Wuhan and Shanghai FIR (P. R. of China)

Submitted by the International Air Carrier Association (IACA)

Proposals:

1. Revised bi-directional route:

B 215 – NUKTI – DCT – YBL
Purpose: reduced mileage

2. New bi-directional route:

YBL – B 215 – DARAN – DCT – GUPAD – DCT – CGO – DCT– ZHO – DCT – HFE (joining R 343 – VMB – ZSPD)
Purpose: reduced mileage, additional route options for traffic to/from Shanghai.

3. New bi-directional route:

MORIT – DCT - DARAN
Purpose: reduced mileage, additional route options for traffic to/from Shanghai.

4. New bi-directional route:

MORIT – DCT – DKO (Connecting to A 596 to/from ZBAA)
Purpose: reduced mileage, additional route options for traffic to/from Beijing.

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VAT BE 424 052 821 - BANK 310-0106764-53