THIRD MEETING OF THE ALLPIRG/ADVISORY GROUP

(Montreal, 6 – 8 April 1999)

Agenda Item 5.7:Interregional coordination and harmonization mechanism – Y2K date change
preparations

STATUS OF Y2K PREPARATIONS AND CONTINGENCY PLANNING IN THE ASIA/PACIFIC REGIONS

(Presented by the Secretariat)

SUMMARY

This paper highlights the work already accomplished as well of further work planned in the Asia/Pacific Region in Y2K contingency arrangements for international aviation operating in and through the region.

1. **INTRODUCTION**

1.1 At the ninth meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/9), held in Bangkok from 24 to 28 August 1998, it was recognized that urgent work needed to commence to cater for possible disruptions to international air traffic within the Asia/Pacific Region due to failure of aviation systems caused by the Year 2000 change-over.

1.2 As a result of discussions held, the following decision was formulated:

Decision 9/47 – Contingency Planning for Y2K problems – Formation of an APANPIRG Y2K Contingency Planning Task Force

That, an APANPIRG Y2K Contingency Planning Task Force be formed as a mechanism for the coordination of contingency arrangements of States in the Asia/Pacific Region leading up to and during the Y2K changeover, with the following Terms of Reference:

- a) address the availability and arrangements for present ATS routes within and across the Region during the contingency period;
- b) manage the development of contingency routing arrangements where new routes need to be established;

- c) develop protocols for determining priorities and arrangements for the continued passage of international air traffic;
- d) oversee coordination of Asia/Pacific routes and communications with adjacent regions that would be available during the contingency period;
- e) facilitate rapid communication between States and among users and service providers during the contingency period;
- f) examine the possible establishment of one or more crisis management unit(s) within the Region to provide assistance to States in the conduction of necessary contingencies. Coordinate these arrangements with adjacent regions; and
- g) develop letters of agreement required to establish the agreed contingency arrangements, if necessary.

address any other matter relevant to facilitate the above.

2. WORK ACHIEVED TO DATE

2.1 At the first Contingency Planning Task Force meeting held in New Delhi, India on 4-6 November 1998, certain actions were agreed by the meeting to accomplish the assignment of the task force in a timely and appropriate manner. Notable amongst these actions were:

Action

That, ICAO, as a matter of urgency, arrange Sub-regional contingency plan meetings based on major traffic flows, for the purpose of developing harmonized plans to cover the areas under consideration.

Action

That, ICAO assist States in their development of State Y2K contingency plans and ensure that State plans harmonize along major traffic flows.

Action

That, ICAO ensure that Y2K contingency plans developed in the Asia/Pacific region harmonize with plans of adjacent regions.

Action

That, ICAO develop plans for the introduction of a Regional Y2K Coordination Centre (RY2K-CC), strategically placed within the region to assist in coordination between States during the critical times of the Year 2000 change-over.

Action

That, States recognize that Y2K contingency plans should be based on international major traffic flows within the Asia/Pacific Region.

Action

That, States accept the need to activate contingency plans well in advance of 1.1.2000 and continue these plans for a period after this critical time. Activation and cessation of Y2K plans requires coordination along the major traffic flow through the RY2K-CC.

Action

That, each State should have its own Y2K National Air Traffic Management Centre (Y2K-NATMC) established that would specifically deal with decisions of that State as well as being a point of contact with the RY2K-CC, ICAO, and IATA if and when required.

Action

That, States accept that contingency plans for major traffic flows are designed to provide for international operations. Domestic operations should be catered for within State's contingency plans so as not to cause interference or disruption to overflying international aircraft.

2.2 Sub-regional Y2K Task Force meetings were subsequently coordinated and arranged in the following locations:

- a) Y2K TF/2 Brisbane, Australia, 25-29 January 1999. The meeting was attended by 58 participants from 11 States, 4 International Organizations and 2 communication service providers.
- b) Y2K TF/3 Singapore, 8-12 February 1999. The meeting was attended by 79 participants from 14 States, 3 International Organizations and 3 communication service providers.
- c) Y2K TF/4 Tokyo, Japan, 22-26 February 1999. The meeting was attended by 80 participants from 12 States, 3 International Organizations and 1 communication service providers.
- d) Y2K TF/5 Bangkok, Thailand, 8-12 March 1999. The meeting was attended by 55 participants from 13 States, 1 International Organization and 2 communication service providers.
- e) Y2K TF/6 Bangkok, Thailand, 15-20 March 1999. The meeting was attended by 20 participants from 6 States and 2 International Organizations.
- f) Y2K TF/7 Beijing, China, 29 March-2 April 1999. At the time of writing, there is expected to be approximately 55 participants from 12 States, 2 international organizations and 3 communications service providers.

Results of sub-regional task force meetings

2.3 Prior to the first of these meetings, a Core Team of four was established which comprised a representative from ICAO (Chairman), IATA and two States (Australia and Singapore), who volunteered their services to be members of the Team and assist in the organization of and work required before, during and after the meetings.

2.4	The meetings followed the same agenda items:		
	Agenda Item 1:	Principles of Y2K Contingency Planning	
	Agenda Item 2:	Meeting Work Programme	
	Agenda Item 3:	Y2K ATS Systems Failures	
		 a) Y2K Communications Failure Planning b) Y2K Navaid Failure Planning c) Y2K ATS Surveillance Failure Planning d) Y2K AIS/MET Failure Planning 	
	Agenda Item 4:	Y2K ATS Route Contingency Planning	
	Agenda Item 5:	Y2K Search and Rescue Contingency Planning	
	Agenda Item 6:	Y2K Contingency Planning - Implementation Strategy	
	Agenda Item 7:	States' Y2K Contingency Plans	
	Agenda Item 8:	Operational Letters of Agreement between Adjoining States	
	Agenda Item 9:	Regional Y2K Coordination Centre (RY2K-CC) and National Y2K Traffic Management Centres (NY2K-ATMCs)	
	Agenda Item 10: Development of Action Plan		
	Agenda Item 11: Other Business		
2.5	Principles of Y2K Contingency Planning		
2.5.1	Six Y2K Contingency Planning Principles were agreed to:		
	PRINCIPLES		

a) that failures as a result of Y2K change-over may occur within ATS systems, either within a single facility or across a wide range of systems and agree that a Y2K contingency plan will be developed to ensure that flight operations can continue in a safe and orderly manner;

Air

- b) that this Y2K contingency plan is based on the assumption that a significant degradation of ATS systems/facilities may occur along the Major Traffic Flows of the Asia/Pacific region;
- c) that Y2K contingency planning is based on the International Major Traffic Flows identified in the Asia/Pacific Regional Plan for the New CNS/ATM Systems;
- d) that this Y2K contingency plan is developed for international operations. Each State is responsible for Y2K contingency plans for domestic flights which should harmonise with international operations;
- e) that the Y2K contingency plan for each Major Traffic Flow should harmonise with States adjoining the Asia/Pacific Region along these Traffic Flows; and
- f) that cooperation is required amongst all States and the aviation industry to ensure the continued flow of international aircraft operations across and through the Region.

2.5.2 These Principles formed the basis in the development of The Regional Y2K Contingency Plan and subsequent State Y2K Contingency Plans.

2.6 Meeting work programme

2.6.1 It was considered that due to the large volume of work to be completed in the time available, it was necessary to form working groups to deal with specific matters relating to ATS contingency route planning and communications contingency matters. The working groups subsequently reported back to the meeting of the whole with their deliberations and recommendations.

2.7 **Y2K ATS systems failures in:**

- a) Communications
- b) Navaids
- c) Surveillance
- d) AIS/MET

Y2K Communication Failure Planning

2.7.1 Considerable discussion took place on communication failure planning.

2.7.2 The meetings recognized that the point-to-point and air-ground communications were essential to a smooth transition through the Year 2000 change-over.

2.7.3 In particular, the meetings reviewed thoroughly alternative communication means to support the contingency situations identified in the draft Regional Y2K Contingency Plan.

2.7.4 States were asked to provide full complement of frequencies assigned the recommended air-ground networks and use HF frequencies as back-up of VHF communication and for other ATS coordination functions, where this was possible to do so.

2.7.5 Options for alternative AFTN links were identified and States were expected to determine viable option and reflected it in their national Y2K contingency plan or in letters of agreement with adjacent States.

2.7.6 In addition to fax and/or IDD voice capabilities, each AFTN station should have a stand-alone AFTN terminal with a dial-up modem to allow basic AFTN communications to be re-established with the main AFTN COM Centre serving that station. In the event of a prolonged outage, AFTN messages should be routed through alternate service facilities, in order of preference depending on the availability of services.

2.7.7 A main AFTN COM Centre should have a different Y2K compliant stand-alone PC-based terminal or standby message switching system with essential functionality, for immediate use when the main equipment fails. The SITA/ARINC message network should be used where a Y2K compliant stand-alone PC-based standby system is not available.

2.7.8 VSAT system located at the ACC/COM Centres was considered as the preferred alternative means available for use in the event of failure of PTT links. INMARSAT satphone link, for voice and data, was also considered as the other alternative to PTT links.

2.7.9 Where automated recording of contingency communications was not feasible, a written log or other recording system such as self-contained voice recorders should be provided to enable a log of traffic to be maintained.

2.7.10 ICAO Regional Office will develop standardised phraseology for CPDLC and message format for VOLMET/ATIS broadcasts on Y2K failure status and include these in a proposed AIP SUPPLEMENT document model and standardise the procedure for world-wide use.

2.7.11 SITA and ARINC were requested to advise States of the Y2K compliance status of their services and the capability to provide alternative means of communications to support AFTN links.

2.7.12 With regard to air-to-air VHF communications, it was agreed that TIBA procedures should be used with the inclusion of sections from IFBP procedures relating to ACAS and transponder requirements. Specific frequencies for air-to-air communication were identified.

Y2K navigation failure planning and ATS surveillance failure planning

2.7.13 The meetings discussed the consequences of Navaid and Surveillance failures and noted the following:

- a) Remote monitoring and control of navaids may be affected by loss of PTT systems.
- b) Surveillance failures planning should cover either the loss of radar facility itself or the loss of the data as presented to controllers at the ATS centres.
- c) Precision approaches such as Cat II and Cat III ILS will be affected by failure of any of the approach, runway, runway exit and CAT II/III holding position lights that are mandatory for such approaches. In addition, RVR measuring instrumentation, where used, must be serviceable for such approaches or an alternative method put in place to provide assessment of RVR.

d) GPS satellites have been certified as Y2K compliant. GPS will continue to be available for en-route and terminal operations including non-precision approaches. Aircraft GPS receivers that meet the Federal Aviation Administration (FAA) Technical Standard Order (TSO C129) for GPS navigation will not encounter any difficulties with the GPS roll-over date of 21 August 1999.

Y2K AIS/MET failure planning

2.7.14 In the event of failure of AFTN minimum OPMET information to support aircraft operations under the contingency arrangements, would be required in the following order of priority:

Safety messages:	SIGMET AND AIRMET
	TAF AMD
	VOLCANIC ASH ADVISORY
	TROPICAL CYCLONE ADVISORY
	SPECIAL AIREP
Routine messages:	METAR
C	SPECI
	TAF

RY2K-CC communications

2.7.15 The meetings considered prioritisation of the communications equipment to be used within the RY2K-CC. It was noted that Inmarsat satphone was included as an alternative data communication means since the Iridium system does not currently provide data communication. The RY2K-CC should have the ability to communicate by voice on both satphone systems (Inmarsat and Iridium). The communication options recommended for this centre are as follows:

Voice:

- 1. IDD
- 2. Satphone Inmarsat and Iridium
- 3. HF portable system

Data:

- 1. AFTN
- 2. Inmarsat satphone
- 3. Fax/Telex
- 4. SITA/ARINC
- 5. Email

2.8 **Y2K ATS route contingency planning**

2.8.1 This was a very important agenda item at all sub-regional meetings and initial work was developed within a contingency routes working group who presented their findings to the meeting of the whole.

2.8.2 Routes were chosen that linked city pairs and where possible to do so, arranged in such a way as to make race track patterns. In addition, already established routes were considered in most cases. Standard flight levels were used and the en-route separation minima of 15 minutes was applied. As much as possible, choke points were avoided and aircraft on crossing routes were required to plan their flight using levels below those assigned to more frequented ATS routes.

2.8.3 Charts of the ATS Y2K contingency route structure for the major traffic flows are attached to this discussion paper, but not including the major traffic flow from East Asia to Europe, north of the Himalayas, as at the time of printing this meeting in Beijing had not been held.

2.8.4 All meetings agreed that, as this plan was focussed on international operations there would be vertical separation maintained between domestic operations on cruise. It was agreed that domestic traffic should plan at level up to and including FL280 and international traffic would plan at FL290 and above.

2.8.5 The meetings agreed that manageable Y2K contingency acceptance rates for traffic should be calculated and coordinated among relevant ATS providers and airspace users. Any unanticipated loss of service that further impacts acceptance rates of airways or airports should be communicated and contingency traffic flow rates should be coordinated between all affected ATS Providers and communicated to aircraft operators and the RY2K-CC.

2.8.6 Due to the limited capacity available when the contingency routes are activated, consideration should be given to the sequencing of aircraft with similar speed regimes onto the same levels, so as to maximise the use of this limited capacity.

2.8.7 States were asked to consider reviewing their airport traffic movement curfew hours, with a view to removing or reducing their duration during the critical period when the contingency routes are activated so as to minimise the reduction in the overall traffic acceptance rate.

2.9 Search and rescue contingency planning

2.9.1 It was considered that there was a need for States to review and examine SAR plans to ensure that contingency arrangements for communication breakdowns were in place and tested. These plans should address the following issues:

- a) communications with aircraft;
- b) communications with other SAR authorities;
- c) methods of activation and termination of a SAR action;
- d) communications with SAR resources; and
- e) response limitations of SAR resources.

2.9.2 In the review and examination process, the meetings noted that consideration should be given to the development of SAR agreements between neighbouring States, should these not already exist. To protect existing SAR agreements, an attachment to these agreements relating to procedures to be used if Y2K failures occur should be developed.

2.9.3 The current and future COSPAS-SARSAT satellite constellations are believed to be Y2K compliant. Furthermore, the National Administrations which provide the ground segment component of the system, Local User Terminals (LUTs), have already implemented or are expected to implement national programmes to achieve the Y2K compliance of the system component for which they are responsible. In this regard, it was noted that the compliance for LUT and software has already been implemented by China, Hong Kong-China, Republic of Korea and Russian Federation. The compliance requirements are planned to be implemented in the USA before March 1999 and in Japan before April 1999.

2.10 Y2K contingency planning – Implementation and deactivation strategy

2.10.1 Some critical dates have been identified by the meetings prior to and after the Year 2000 change-over time of midnight on 31 December 1999. Whilst some functional failures may occur during these times, it was considered by the meetings that, unless further evidence is forthcoming, these dates should be treated with respect and that States should ensure that additional resources are available to manually process data, if necessary, and that the aviation community was made aware of the potential degradation of services due to corrupt data. These dates are:

a) Saturday, 21 August 1999:

Global positioning system (GPS) clocks reset to zero;

b) Wednesday, 1 September 1999 and Thursday, 9 September 1999:

9s rolling over – some software routines define an indeterminate date as 9999;

c) Tuesday, 29 February 2000:

Leap year – this is a problem for systems unable to correctly determine the day following 28 February 2000.

2.10.2 A NOTAM (s) may need to be promulgated to inform the aviation industry of these dates and possible failures which may occur.

Activation of the contingency plan

2.10.3 The meetings considered that one of the major issues which needed to be resolved was how the agreed State Y2K plans would be implemented on 31 December 1999 in a consistent fashion throughout the Asia/Pacific region in order that they harmonise with the major traffic flows affected by the State's concerned. In particular any implementation strategy would need to ensure that air traffic, especially international air carriers, are able to continue operations through the critical period without major disruption. The critical time periods that need to be considered in the transition to contingency plans would be:

- a) the local time rollover where outside infrastructure may be affected which may cause indirect disruption to ATS systems; and
- b) the UTC time rollover, which is the time normally assigned to ATS systems.

2.10.4 It was agreed by the meetings that the start time for activation would be no less than one hour ahead of midnight 31 December 1999 and that the following methodology for implementation of the contingency plan would be used:

- a) that the traffic flow areas which had been discussed be broken into activation time zones, each two hours apart, that provided for a minimum activation time of 1 hour prior to the local time Year 2000 change-over (i.e. 2300 local time). Therefore, it was recognised that some FIRs would activate their contingency planning prior to 2300 local time. The agreed zones were as follows:
 - the FIRs within the States of Fiji, New Zealand, Samoa, and Russia (Anadyr, Mys Schmidta, Petropavlovsk-Kamchatsky, Chaybukha, and Pevek) will activate the Y2K contingency plan at 31121000UTC. This will also apply to aircraft flying to/from the US via the South Pacific from the Oakland FIR;
 - 2) the FIRs within the States of Australia, Papua New Guinea, Solomon Islands, and Russia (Seymchan, Chersky, Zyryanka, Magadan, Okha, Yuzhno-Sakhalinsk, Nikolaevsk-na-Amure, Vladivostok, Khabarovsk) will activate the Y2K contingency plan at 31121200UTC. This will also apply to aircraft flying to/from Asia via the South Pacific from the Oakland FIR (between 130E to 160E and south of 21N);
 - 3) the FIRs within the States of China, DPR Korea, Republic of Korea, Japan, Vietnam, Hong Kong China, Indonesia, Malaysia, Philippines, Brunei, Thailand, Cambodia, Laos, Mongolia, Singapore, and Russia (Yakutsk, Batagay, Tiksi, Zhigansk, Chulman, Mirny, Khatanga, Turukhansk, Norilsk, Dikson, Magdagachi, Blagoveschensk, Chita, Kirensk, Bratsk, Yeniseysk, Krasnoyarsk, Kolpashevo, Irkutsk, Barnaul, Semipalatinsk, Novosibirsk), will activate the Y2K contingency plan at 31121400UTC; and
 - the FIRs within the States of Bangladesh, Bhutan, India, Maldives, Myanmar, Nepal, Pakistan and Sri Lanka, will activate the Y2K contingency plan at 31121600 UTC;
- b) aircraft intending to operate within the traffic flow during the time that the contingency routes are active, shall flight plan to be established on these routes before the zone activation time. This process will be transparent to the air traffic controller; and
- c) States shall ensure that all requirements of the traffic flow contingency plan are applied by the agreed activation times.

2.10.5 In order to give uniformity to the contingency plan it was suggested that a similar methodology for activation of Y2K contingency measures be introduced in other ICAO regions.

Deactivation of the contingency plan

2.10.6 An eight step process was developed in order that the deactivation of the plan to be managed by a staged recovery from contingency conditions. Deactivation would be addressed along each individual traffic flow as distinct from the region as a whole. 2.10.7 In addition, the cancellation of the plan and resumption of normal services should take the following into consideration:

- a) that both critical times of 1 January 2000 midnight local and UTC have taken place;
- b) that a State's ATS provider has confidence in the safety and integrity of the ATS system to remain functioning normally;

Note: In the event that equipment is out of service for a prolonged period, States should consider its ATS capabilities in the light of such outage. For example, if a radar site supporting en route operations was out of service but because satisfactory air – ground communications exist, a State may determine that normal operations could resume. Another example may be if an ILS is out of service but actual and forecast weather indicates good VFR, then a State may elect to resume normal operations.

c) that airports serving arrivals, departures are open and operational; and

Note: If an airport is operational but on standby power or services, and the surrounding city is suffering significant disruptions, i.e. loss of power, telecommunications, etc., then the State ATS provider should consider remaining in contingency mode.

d) that coordination with adjacent States, RY2K-CC, and adjacent RY2K-CCs that have any jurisdiction over a common geographical traffic flow has been completed.

2.11 State contingency plans

2.11.1 The meetings agreed that both Regional and State Y2K Contingency Plans are intended to provide alternative procedures, facilities and services to those provided for in the regional air navigation plan when those facilities and services are disrupted.

2.11.2 The meetings also recognised that both Regional and State Y2K Contingency Plans required the approval of the President on behalf of the ICAO Council before implementation.

2.11.3 The meetings supported the notion that contingency plans must be acceptable to providers and users of contingency services alike, specifically in terms of the ability of the providers to discharge the functions assigned to them and to ensure the safety of operations and traffic handling capacity. Additionally, the importance of a State's Y2K contingency plan harmonising with neighbouring States as well as along the major traffic flow operating over and through that particular State was recognised.

2.11.4 It was recognised that a significant amount of information will need to be disseminated to aircrew and ATS staff. It was agreed that this would be accomplished by AIP Supplement with a deadline for completion by 1 August 1999. A draft format for this AIP Supplement has been developed for inclusion in both Regional and State Y2K Contingency Plans.

2.12 **Operational Letters of Agreement**

2.12.1 It was agreed that where existing LOAs are in place, contingency arrangements between States could be incorporated as amendments or attachments. Further, the meeting accepted that alternatively,

Supplementary Letters of agreement (SLOAs), Memorandums of Understanding (MOUs), or Annexes could be developed to cover specific Y2K arrangements between States.

2.12.2 These SLOAs etc, would also need to be completed by 1 August 1999.

2.13 Regional Y2K Coordination Centre (RY2K-CC) and National Y2K Air Traffic Management Centres (NY2K-ATMCs)

2.13.1 All meetings supported the establishment of a RY2K-CC and NY2K-ATMCs on the basis that it is important to ensure a coordinated approach so that flight safety is not compromised in the event of ATS systems being affected by Y2K initiated failures. It was also agreed that the location of the RY2K-CC should be at the ICAO office in Bangkok which has most of the communications facilities available at the moment.

2.13.2 Further work is still required regarding the staffing of both the RY2K-CC and the NY2K-ATMCs as well as communication equipment which may need to be installed. The RY2K-CC would have a coordination and facilitation of information role, both on a regional basis as well as information from other regions during the activation period. It would not take away any function which was the responsibility of the State.

2.14 Y2K Contingency Action Plan

2.14.1 A list of action items to be undertaken by ICAO, States and Private Communications Service Providers has been developed.

3. **FURTHER WORK TO BE ACCOMPLISHED**

3.1 All States have been reminded that the excellent cooperation shown by State ATS providers as well as airspace users in the development of the Regional Y2K Contingency Plan will need to continue in order to have all that is required in place by 1 August 1999.

3.2 Commencing on 12 - 16 April, the Core Team will assist ASEAN States in the formulation of their State Contingency Plans and LOAs between members of ASEAN in a meeting to be held in Singapore. It is envisaged that this type of work will need to be carried out in other parts of the Asia/Pacific region as well as meetings with adjacent States in other ICAO regions.

3.3 To meet the target date of 1 August 1999, which is the time when AIP Supplements concerning Y2K Contingency Planning need to be finalised for despatch to chart-makers etc, a considerable amount of work by States and international organizations is still required to overcome any failures to the ATS systems and facilities within the Asia/Pacific Region.

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APPENDIX

CHARTS OF THE ATS Y2K CONTINGENCY ROUTE STRUCTURE FOR MAJOR TRAFFIC FLOWS*

Secretariat Note: This appendix contains 6 charts which are available in hard copy only. They depict:

Chart of Contingency Routes Southeast Asia – Northeast Asia Russian Far East Routes Westbound Contingency Routings to Europe Contingency Routes for Asia to Europe Traffic Flows (South of the Himalayas) Contingency Routes for Traffic Flows from Asia to Africa

-END -

^{*}Excluding the major traffic flow from East Asia to Europe, north of the Himalayas