GLOBAL AIR NAVIGATION PLAN , APAC REGIONAL AIR NAVIGATION PLAN AND NATIONAL AIR NAVIGATION PLAN FOR SRI LANKA

OVERVIEW

- ▸ Global Air Navigation Plan
- ▸ Regional Air Navigation Plan
- ▸ Structure of APANPIRG and APANPIRG Meetings
- ▸ Aviation System Block Upgrades (ASBU)
- ▸ Seamless ATM Implantation Plan
- ▸ SLANPIG

GLOBAL AIR NVIGATION PLAN - GANP

- The GANP is a strategic document that will guide the Regional planning and implementation regional groups (PIRGS), international organizations and States to plan their air navigation systems in order to enhance the efficiency

- It contains guidance for states for short term, mid term and long term improvement needed for their Air Navigation Systems

- However GANP is updated by ICAO ANC time to time in order to ensure its relevance and compatibility.

REGIONAL AIR NAVIGATION PLAN - RAN

- All ICAO regions are supposed to develop their Regional Air Navigation Plans in accordance with the guidance provided by ICAO in its Global Air Navigation Plan (GANP).

- Normally the "Planning and Implementation Groups" (PIRGS) formed in each ICAO Regional Offices are responsible for the development of "Regional Air Navigation Plans".

ASIA PACIFIC AIR NAVIGATION PLANNING AND IMPLEMENTATION GROUP (APANPIRG)

Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG)

▸ The "APANPIRG" has been established by the Council of ICAO, in 1991, as recommended by the Air Navigation Commission.

▸ It was established on 26 June 1991 by the council with an initial membership of fifteen (15) States.

▸ In the year 2010 the membership was extended to all States in the region who provide ANS

▸ At present all Contracting States in the Region who provide Air Navigation Services in the region are Members of APANPIRG

Composition of "APANPIRG"

- All APANPIRG member States in the Region must nominate a <u>representative</u> and an alternative representative for APANPIRG

- They will represent the State at APANPIRG Meetings with subject experts

- The Chairperson of the Group will be elected from the representatives of the States

- The First and Second Vice Chairperson will be elected from above representatives by the Secretary

- The ICAO Regional Director will be working as the Secretary

Conclusions and Decisions of the Meeting

▸ ## Conclusions

Conclusions are the outcomes (decisions) of APANPIRG meetings which require the attention of States for the implementation of those.

▸ ## Secretary shall:

- a) initiate the required action;

    i) through the relevant ICAO Regional Office, invite States and international organizations or other bodies as appropriate

    to undertake the tasks called for by the Conclusion concerned; or

    ii) refer them to Council and the Air Navigation Commission for appropriate action.

Decisions

Decisions relate solely to matters dealing with the internal working arrangements of the Group and its sub-groups.

APANPIRG SUB GROUPS

▸ To assist it in its work, APANPIRG may create sub-groups, charged with preparatory work on specific problems requiring expert advice for their resolution.

Structure of APANPIRG

- ▸ Air Traffic Management Sub Group - ATM (SG)

- ▸ Communication Navigation & Surveillances Sub Group – CNS (SG)

- ▸ Meteorology Sub Group – MET (SG)

- ▸ Regional Airspace Safety Monitoring Advisory Group - RASMAG

ATM (SG) - ATM Sub Group

▸ Deals with problems related to ATM matters in the region

▸ At present 7 sub groups in the form SG, WG, CG, TF are working under ATM (SG) in order to resolve problems in different subject areas under ATM;

1) AAITF – AIS AIM Implementation TF
2) APSARTF – Asia Pacific SAR TF
3) AOP/WG – Aerodromes Operations & Planning WG
4) ATFM/SG – Air Traffic Flow Management SG
5) RACP/TF – Regional ATM Contingency Planning TF
6) SAIOACG – South Asia/Indian Ocean ATM Coordination Group
7) SEASG – South East Asia ATS Coordination Group

CNS (SG) - CNS Sub Group

▸ Deals with the problems related to CNS matters in the Region.

▸ There are 7 SGs working under CNS/SG at present;

1) ADS-B SITF - ADS - B Study and Implementation Task force
2) ACSICG - Aeronautical Communication Services Implementation Coordination Group
3) APA/TF - AIDC Implementation Task Force
4) CRV/TF - Common Regional Virtual Private Network (VPN) Task Force
5) IS/TF - Ionospheric Studies Task Force
6) PBNICG - Performance Based Navigation Implementation Coordination Group
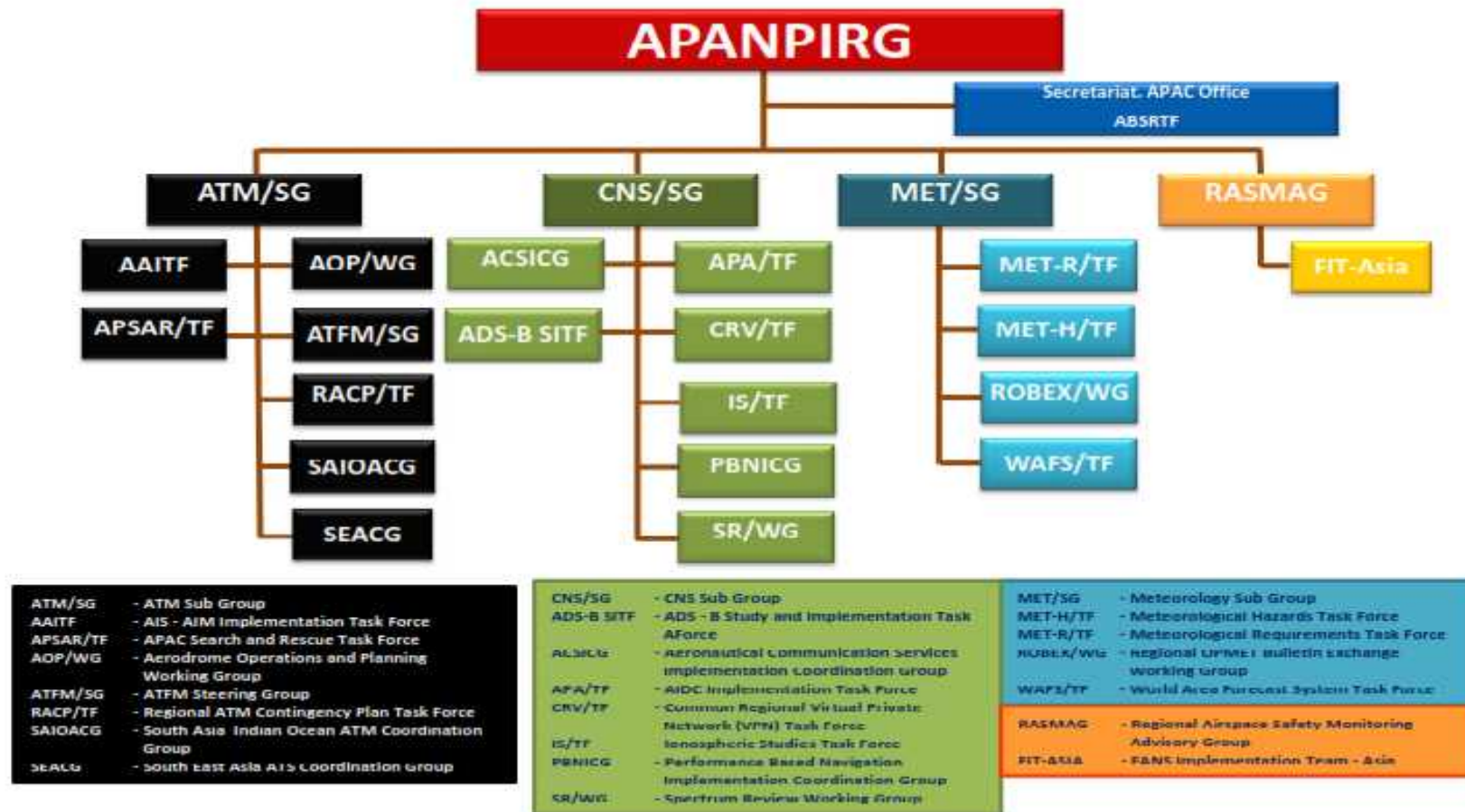7) SR/WG - Spectrum Review Working Group

MET (SG) - Meteorology Sub Group

▶ MET/SG Deals with the problems related to Aviation Meteorology in the Region

▶ There are 4 Sub Groups working under MET (SG)
- MET-H/TF - Meteorological Hazards Task Force
- MET-R/TF - Meteorological Requirements Task Force
- ROBEX/WG - Regional OPMET Bulletin Exchange Working Group
- WAFS/TF - World Area Forecast System Task Force

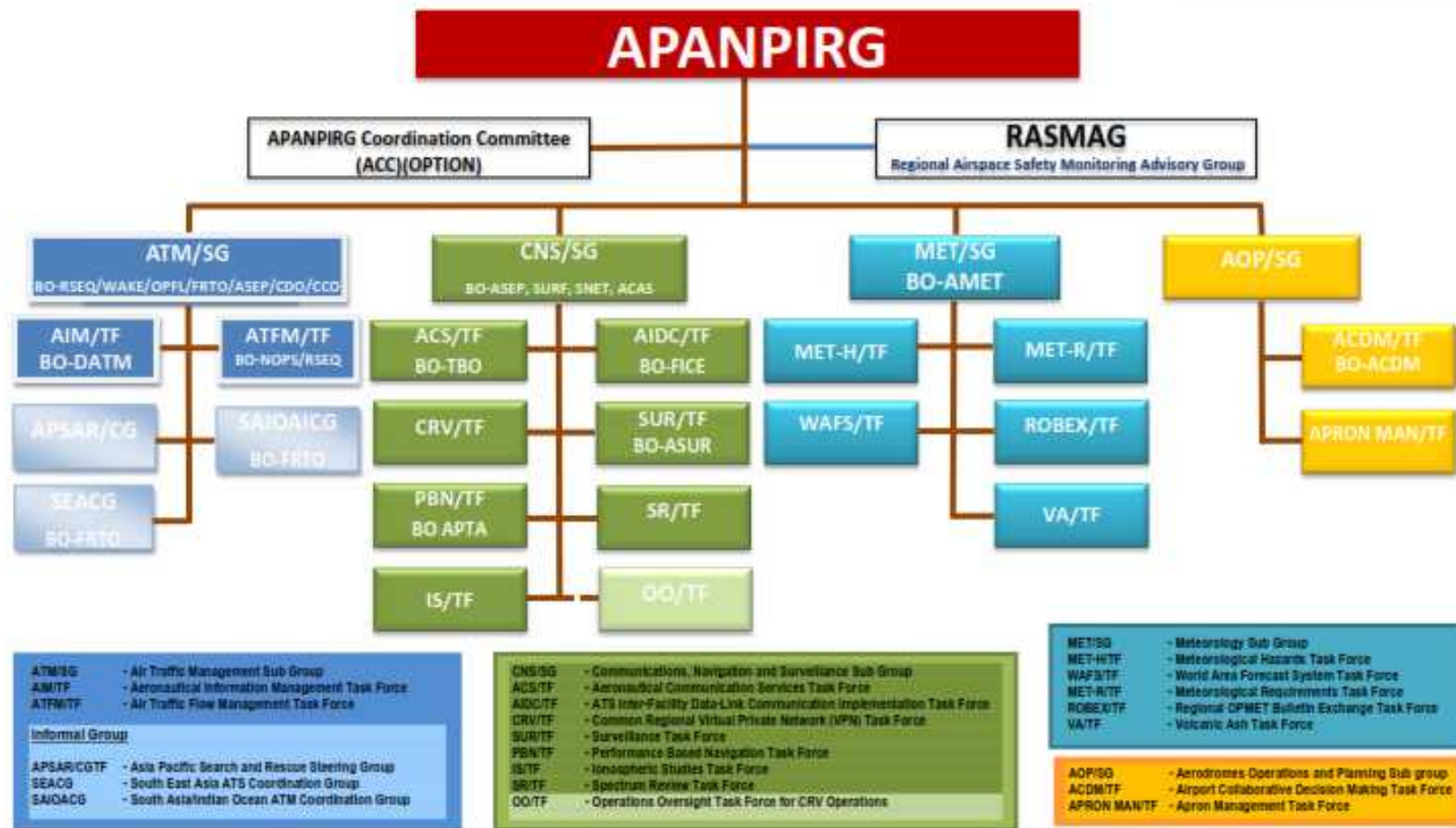# RASMAG - Regional Airspace Safety Monitoring Advisory Group

▸ This advisory group deals with Regional Airspace Safety Monitoring

▸ Only one SG working under RASMAG

FIT-ASIA - FANS Implementation Team - Asia

APANPIRG – PRESENT STRUCTURE

APANPIRG – REVISED STRUCTURE

National Air Navigation Plan

- Each State should develop a "National Air Navigation Plan" inline with "Regional Air Navigation Plan".

- CAA has identified that in order to prepare an effective National Air Navigation Plan negotiations with all stake holders related to the provision of ANSs in the State are required.

- The reason for the formation of Sri Lanka National Planning and Implementation Group (SLANPIG) is that.

- The main objective of SLANPIG is to prepare a ANP for Sri Lanka and implement it.

Aviation System Block Upgrades - ASBU

12th AIR NAVIGATION CONFERENCE - 2012

- At 12th ICAO Air Navigation Conference in 2012 a revised GANP was proposed by ICAO in order to meet the increasing demand for air transportation

- ICAO Introduced a concept called "Aviation System Block Upgrades" (ASBU) to implement this revised GANP

- The aim of ASBU initiative is to provide a global approach for facilitating interoperability, harmonization, and modernization of air transportation world-wide.

- At this conference it was decided to implement the new GANP using the concept of ASBU.

WHAT IS ASBU ?

- An Aviation System Block Upgrade defines a four performance improvement areas that can be implemented globally in order to enhance the performance of the Air Traffic Management System (ATM)

- In the concept of ASBU ICAO has defined four blocks from B_0 to B_3 . These four blocks are planned to be implemented approximately within 20 years from 2013 to 2028 and beyond. Time allocated for one Block is 5 years.

ASBU

Performance Improvement Areas	Block 0 (2013)	Block 1 (2018)	Block 2 (2023)	Block 3 (2028 & >)	No of Modules
Greener Airports					14
Globally Interoperable Systems and Data					12
Optimum Capacity and Flexible Flights					12
Efficient Flight Path					09
					47
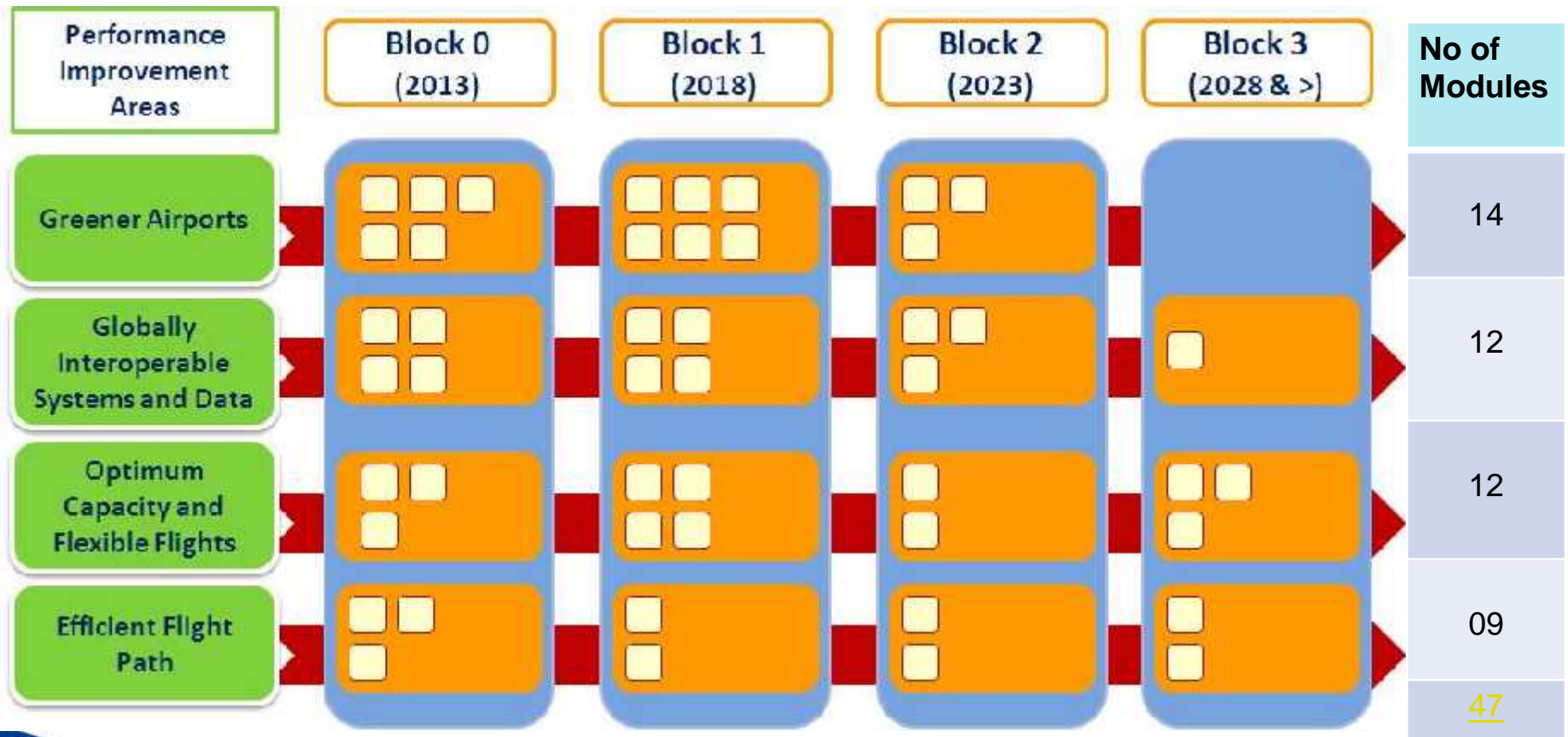
Doc 9750

Main Areas Focused

1. Implementation of Performance Based Navigation
2. Implementation of CDM
   i. A-MAN, D-MAN
   ii. Air Traffic Flow Management System
3. Automation of AIS
4. Implementation of System Wide Information Management (SWIM)
5. Implementation Free Routing, Flexible Routes (Flex Tracks), Flexible use of Air Space
6. Seamless Airspace
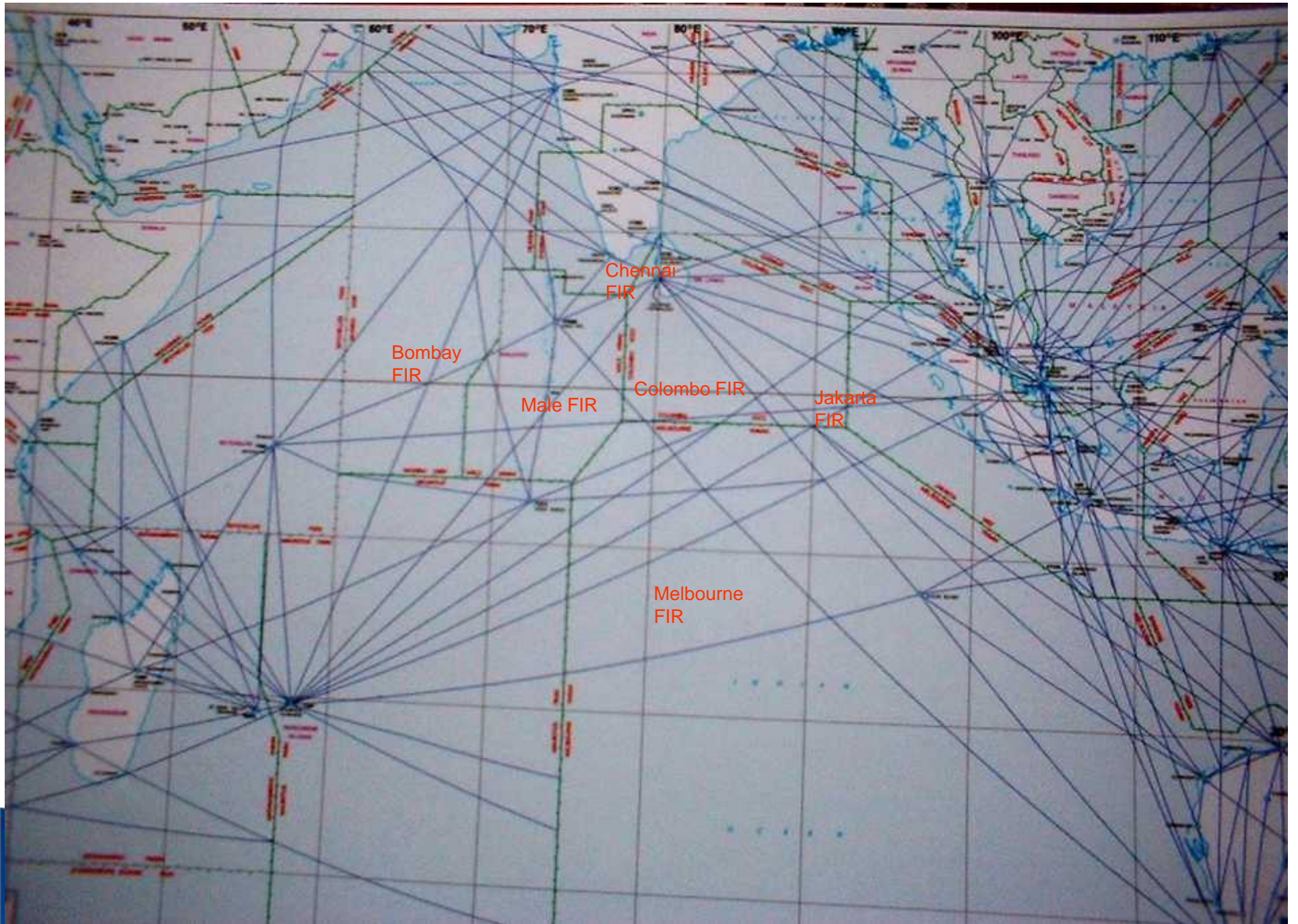
SEAMLESS ATM IMPLEMENTATION PLAN

Understanding Seamless ATM

▶ **What is Seamless ATM?**

Interoperable and harmonized ATM Systems

▶ **Seamless ATM History**

Historically, States and ANSPs have developed their own infrastructure only to suit their own national needs

In the recent past (before ICAO introduced ASBU) some regions in the world developed some "interoperable and harmonized ATM Systems" in all States in those Regions – Eg. European SESAR (Single European Sky ATM Research) - North American - NextGen.

Asia/Pacific Region has developed a "Seamless ATM Plan" based on ASBU concept.

Understanding Seamless ATM

▶ **Asia/Pacific Seamless ATM Plan**

The Asia/Pacific Seamless ATM Plan incorporated the Aviation System Block Upgrades (ASBU).

Further they have added a significant number of human performance and civil/military cooperation elements.

The Seamless ATM Plan and implementation guidance material is available on the Regional Office web site, under 'APAC e-Documents'

Understanding Seamless ATM

INTERNATIONAL CIVIL AVIATION ORGANIZATION

ASIA/PACIFIC SEAMLESS ATM PLAN

Version 1.0, June 2013

This Plan was developed by the Asia/Pacific Seamless ATM Planning Group (APSAPG)

Approved by APANPIRG/24 and published by the
ICAO Asia and Pacific Office, Bangkok

Understanding Seamless ATM

- **Two Areas of Applicability:**

   Preferred Aerodrome/Airspace and Route Specifications (PARS, this is the area aerodrome operators will be mainly concerned with); and

   Preferred ATM Service Levels (PASL)

- **Two Phases:**

   Phase I (12 November 2015); and

   Phase II (18 November 2018).

APAC Seamless ATM Weaknesses

- **Examples of Consequences**

  Slow and non-harmonised implementation across the region

  Safety consequences from poor planning and lack of coordination/consultation

  Unplanned workload stress and lack of efficiency

  Individuals unfairly blamed for systemic problems and mistakes repeated.

Seamless ATM Elements

PARS Phase 1

1. Apron Management

2. ATM Coordination

3. Capacity Analysis

4. Electronic Surface Movement Guidance and Control

5. A-CDM

Aerodrome Operations

7.1 All high density international aerodromes (100,000 scheduled movements per annum or more) should:

a) provide an appropriate apron management service in order to regulate entry of aircraft into and coordinate exit of aircraft from the apron;

b) have appropriate ATM coordination (including meetings and agreements) related to:

- airport development and maintenance planning;
- coordination with local authorities regarding environmental, noise abatement, and obstacles;
- ATM/PBN procedures for the aerodrome;

c) conduct regular airport capacity analysis, which included a detailed assessment of passenger, airport gate, apron, taxiway and runway capacity; and

d) provide electronic surface movement guidance and control.

Note 1: the 100,000 movement benchmark must not be viewed as lessening more stringent existing requirements and criteria established by the State, or superseding ICAO Annex 14 Volume I requirements, especially with regard to aerodrome certification.

Note 2: the provision of A-SMGCS should be subject to economic analysis (ASBU Priority 3).

7.2 All high density aerodromes should operate an A-CDM system serving the MTF and busiest city pairs, with priority implementation for the busiest Asia/Pacific aerodromes (ASBU Priority 2)[1].

Seamless ATM Elements

High Density Terminal Operations

1. Continuous Climb and Continuous Descent Operations (CCO/CDO)

2. PBN Standard Instrument Departures and Terminal Arrivals SID/STAR

3. Instrument runways with guidance

Terminal Operations (Category T airspace)

7.3   CCO and CDO operations should be considered for implementation at all high density international aerodromes after analysis, based on a performance-based approach (ASBU Priority 2).

Note: this does not preclude a State considering implementation of CCO/CDO at other aerodromes as appropriate.

7.4   All international high density aerodromes should have RNAV 1 (ATS surveillance environment) or RNP 1 (ATS surveillance and non-ATS surveillance environments) SID/STAR.

7.5   Where practicable, all high density aerodromes with instrument runways serving aeroplanes should have (ASBU Priority 2):

a)   precision approaches; or

b)   Approaches with Vertical Guidance (APV), either RNP APCH with Barometric Vertical Navigation (Baro–VNAV) or augmented GNSS (SBAS or GBAS); or

c)   if an APV is not practical, straight-in RNP APCH with Lateral Navigation (LNAV).

Seamless ATM Elements – Phase 1

Aircraft Equipage – High Density Terminal Airspace

1. Automatic Dependent Surveillance-Broadcast (ADS-B

2. Aircraft Safety Nets

3. PBN capability

En-route Operations

7.6   All Category S upper controlled airspace and Category T airspace supporting high density aerodromes should be designated as non exclusive or exclusive as appropriate ADS B airspace requiring operation of ADS-B using 1090ES with DO-260/260A and 260B capability, with priority implementation for the following high density FIRs (Figure 9) supporting the busiest Asia/Pacific traffic flows (APANPIRG Conclusion 22/8 and 23/5 refer).

a) South Asia: Delhi, Mumbai;

b) Southeast Asia: Bangkok, Hanoi, Ho Chi Minh, Jakarta, Kota Kinabalu, Manila, Sanya, Singapore, Vientiane; and

c) East Asia: Beijing, Fukuoka, Guangzhou, Hong Kong, Kunming, Incheon, Shanghai, Shenyang, Taibei, Wuhan.

7.7   All Category R and S upper controlled airspace, and Category T airspace supporting high density aerodromes should require the carriage of an operable mode S transponder within airspace where Mode S radar services are provided; and ACAS and Terrain Awareness Warning Systems (TAWS), unless approved by ATC (ASBU Priority 2).

7.8   All Category R and S upper controlled airspace, and Category T airspace supporting high density aerodromes should be designated as non-exclusive or exclusive PBN airspace as appropriate. This is to allow operational priority for PBN approved aircraft, harmonised specifications and to take into account off-track events such as weather deviations, with priority implementation for high density FIRs.

Note: Non-exclusive means that non-PBN aircraft may enter the airspace, but may be accorded a lower priority than PBN aircraft, except for State aircraft.

Seamless ATM Elements – Phase II

Aerodrome Operations

1. Aerodrome Infrastructure and Facilities

2. Aerodrome Terminal and Runway Capacity

Aerodrome Operations

7.12   Where practicable, all high density aerodromes should provide the following infrastructure and facilities to optimise runway capacity:

a) additional runway(s) with adequate separation between runway centrelines for parallel independent operations;

b) parallel taxiways, rapid exit taxiways at optimal locations to minimize runway occupancy times and entry/exit taxiways;

c) rapid exit taxiway indicator lights (distance to go information to the nearest rapid exit taxiway on the runway);

d) twin parallel taxiways to separate arrivals and departures;

e) perimeter taxiways to avoid runway crossings;

f) taxiway centreline lighting systems;

g) adequate manoeuvring area signage (to expedite aircraft movement);

h) holding bays;

i) additional apron space in contact stands for quick turnarounds;

j) short length or tailored runways to segregate low speed aircraft;

k) taxi bots or towing systems, preferably controlled by pilots, to ensure efficiency and the optimal fuel loading for departure; and

l) advanced visual docking guidance systems.

7.13   All high density aerodromes should have a declared airport terminal and runway capacity based on a capacity and efficiency analysis, to ensure the maximum possible efficiency of aircraft and passenger movement. Sample runway capacity figures are provided from several States in **Appendix G**.

Seamless ATM Elements – Phase II

Terminal Airspace

▸ Rotary Wing PBN Procedures

▸ PBN SID/STAR

▸ Instrument Runways with Guidance

Terminal Operations (Category T airspace)

7.14   RNP 0.3 arrival/departure, approach and/or en-route transiting procedures should be considered at high density aerodromes with rotary wing operations.

7.15   All international aerodromes should have **RNAV 1** (ATS surveillance environment) or **RNP 1** (ATS surveillance and non-ATS surveillance environments) SID/STAR.

Note: the Asia/Pacific PBN Plan Version 3 required RNAV 1 SID/STAR for 50% of international airports by 2010 and 75% by 2012 (priority should be given to airports with RNP Approach); and RNAV 1 or RNP 1 SID/STAR for 100% of international airports and 70% of busy domestic airports where there are operational benefits by 2016.

7.16   Where practicable, all aerodromes with instrument runways serving aeroplanes should have (ASBU Priority 2):

a) precision approaches; or

b) APV, either RNP APCH with Barometric Vertical Navigation (Baro–VNAV) or augmented GNSS (SBAS or GBAS); or

c) when an APV is not practical, straight-in RNP APCH with LNAV.

Seamless ATM Elements – Phase II

PBN Approaches

- Approach withVertical Guidance (APV) (7.16)

- Segregated SID/STAR for Low Speed Aircraft (7.15)

- PBN-based Visual Procedures

- Holistic Planning

<u>Terminal Operations (Category T airspace)</u>

7.14   **RNP 0.3** arrival/departure, approach and/or en-route transiting procedures should be considered at high density aerodromes with rotary wing operations.

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    c)   when an APV is not practical, straight-in RNP APCH with LNAV.

Seamless ATM Elements – Phase II

Aircraft Equipage – Terminal Airspace

1. Mode S Transponders

2. Aircraft Safety Nets

3. ADS-B equipage Mandates

En-route Airspace

7.21   All Category R and S upper controlled airspace, and Category T airspace should, unless approved by the State, require the carriage of an operable:

    a)   mode S transponder within airspace where Mode S radar services are provided; and

    b)   ACAS and TAWS (ASBU Priority 2).

7.23   All Category S upper controlled airspace and Category T airspace should be designated as non-exclusive or exclusive as appropriate ADS-B airspace requiring operation of ADS-B using 1090ES with DO-260/260A and 260B capability.

Seamless ATM Elements – Phase II

PASL Phase I

Aerodrome/Terminal Operations
- AMAN/DMAN
- Meteorological Data

PASL Phase II
Aerodrome/Terminal Operations
- ATC Terminal Capacity
- AMAN/DMAN

Aerodrome Operations

7.25   All high density aerodromes should have AMAN/DMAN facilities (ASBU priority 2).

Terminal Operations

7.26   All high density aerodromes should provide meteorological forecasts, aerodrome warnings and alerts that support efficient terminal operations (ASBU Priority 2).

Aerodrome Operations

7.43   ATM system design (including ATS surveillance, ATS communication systems, ATC separation minimum, aircraft speed control and ATC training) should be planned and implemented to support optimal aerodrome capacity expectations for the runway(s) concerned.

Terminal Operations

7.44   All terminal ATC Sectors should have a nominal aircraft capacity figure based on a scientific capacity study and safety assessment, to ensure safe and efficient aircraft operations.

*Note: A study of the terminal ATC Sector airspace capacity every 15 minutes is provided in **Appendix G**.*

7.45   All AMAN systems should take into account airport gates for runway selection and other aircraft departures from adjacent gates that may affect arriving aircraft.

SEAMLESS ATM REPORTING

- ICAO RO has Set up a Web based reporting system for all States to report the progress of the implementation of Seamless ATM

- Present status of reporting by SL, after coordinating with relevant HODs in the AASL is given below.

Sri Lanka Air Navigation Planning and Implementation Group – SLANPIG

Terms of Reference

MEMBERSHIP - CAASL

The following organizations and post holders will serve as members of the SLANPIG and they could take part at any of the SLANPIRG meetings or subgroup meetings, as and when required.

Civil Aviation Authority of Sri Lanka
- Chairman
- Director General of Civil Aviation and Chief Executive Officer
- Additional Director General/CAA
- Deputy Director General/Airspace and Security Regulations
- Director, Aeronautical Services
- Director, Aerodromes

Membership - AASL

▸ **Airport and Aviation Services Ltd**

  Chairman,

  Vice Chairman,

  Executive Director,

  Head of Air Navigation Services

  Head of Electronics

  Head of Electrical

  Head of AM

Membership - SLAF

▸ **Sri Lanka Air Force**
Commander
Director, Operations

Membership – Dept. of Met

- ## Department of Meteorology
  Director General of Meteorology

Chairman and Secretary to SLANPIG

- DGCA shall chair the SLANPIG meetings

- Deputy Director General/Airspace and Security Regulations shall be the Secretary to the SLANPIRG meetings who shall maintain records relating to all activities of the SLANPIG.

Meetings

‣ SLANPIRG shall meet as and when required but at least once in every quarter of the year.

Objectives of the SLANPIRG

▸ to develop, adopt and regularly update a comprehensive Air Navigation Plan for Sri Lanka and other associated documents in a manner that is harmonized with APAC regional air navigation plans, consistent with ICAO SARPs and Global Air Navigation Plan for CNS/ATM systems (Doc 9750) and reflecting national requirements;

▸ to facilitate the implementation of air navigation systems and services as identified in Sri Lanka Air Navigation Plan with due observance to the primacy of air safety, regularity and efficiency; and

▸ to identify and address specific deficiencies in the air navigation field.

Duties and functions of SLANPIG

- review, and propose when necessary, the target dates for implementation of facilities, services and procedures to facilitate the coordinated development of the Air Navigation Systems in Sri Lanka;

- assist the Ministry of Civil Aviation in fostering the implementation of the Sri Lanka Air Navigation Plan in line with the Regional and Global Air Navigation Plans

- facilitate the conduct of any necessary systems performance monitoring, identify specific deficiencies in the air navigation field, especially in the context of safety, and propose corrective action;

- facilitate the development and implementation of action plans by the respective stake holders to resolve identified deficiencies, where necessary;

Duties and functions of SLANPIG

▸ develop amendment proposals to update Sri Lanka Air Navigation Plan to reflect changes in the operational requirements;

▸ monitor implementation of air navigation facilities and services and where necessary, ensure inter organizational harmonization, taking due account of organizational aspects, economic issues (including financial aspects, cost/benefit analyses and business case studies) and environmental matters;

▸ examine human resource planning and training issues and propose where necessary human resource development capabilities in the region that are compatible with the Sri Lanka Air Navigation Plan;

Duties and functions of SLANPIG

▸ develop and adopt Statement of Basic Operational Requirements and Planning Criteria in the field of air navigation in line with global and regional air navigation plans;

▸ advice the Government on requirements in the field of Air Navigation and maintain close cooperation with relevant organizations to optimize the use of available expertise and resources; and ,

▸ conduct the above activities in the most efficient manner possible with a minimum of formality and documentation and call meetings of the SLANNPIG when deemed necessary to do so.

Formation of Task Force SLANP – TF

- Proposed Chairman – Director/ANS

- 1st Vice Chairman – Head of E and ANE / AASL
- 2nd Vice Chairma – Director /Aerodromes
- Members
  - ATS/CAA and AASL
  - CNS/CAA and AASL
  - AIS/CAA and AASL
  - Aerocom:/AASL
  - MET/Dept of Met

Tasks Proposed

▸ **TOR of the TF to be prepared by the TF to cover following;**

- Preparation of SLANP in line with APAC Regional ANP
- Preparation of implementation plan in line with APAC Seamless ATM Plan
- Coordinate with ANS providing agencies in preparation of implementation plan
- Look into ICAO Audit findings which need collective actions of more than one ANS service provider