



INTERNATIONAL CIVIL AVIATION ORGANIZATION

A United Nations Specialized Agency

**ICAO ASIA/PACIFIC REGION
SEAMLESS ATM PLAN
AND
DRAFT FRAMEWORK FOR COLLABORATIVE ATFM**

INTERNATIONAL CIVIL AVIATION ORGANIZATION

28/06/2015

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About ICAO



About ICAO



- International Civil Aviation Organization
 - Created in 1944
 - Convention on International Civil Aviation
 - 191 Signatory States
 - Works to develop international Standards and Recommended Practices (SARPS)
 - Used by States and Administrations to develop their legally binding national civil aviation regulations



- International Civil Aviation Organization
 - Convention on International Civil Aviation
 - “Chicago Convention”
 - Article 12
 - Each contracting State undertakes to keep its own regulations uniform, to the greatest possible extent, with those established under the convention.
 - Annexes to the Convention
 - International Standards and Recommended Practices adopted by the Council of ICAO

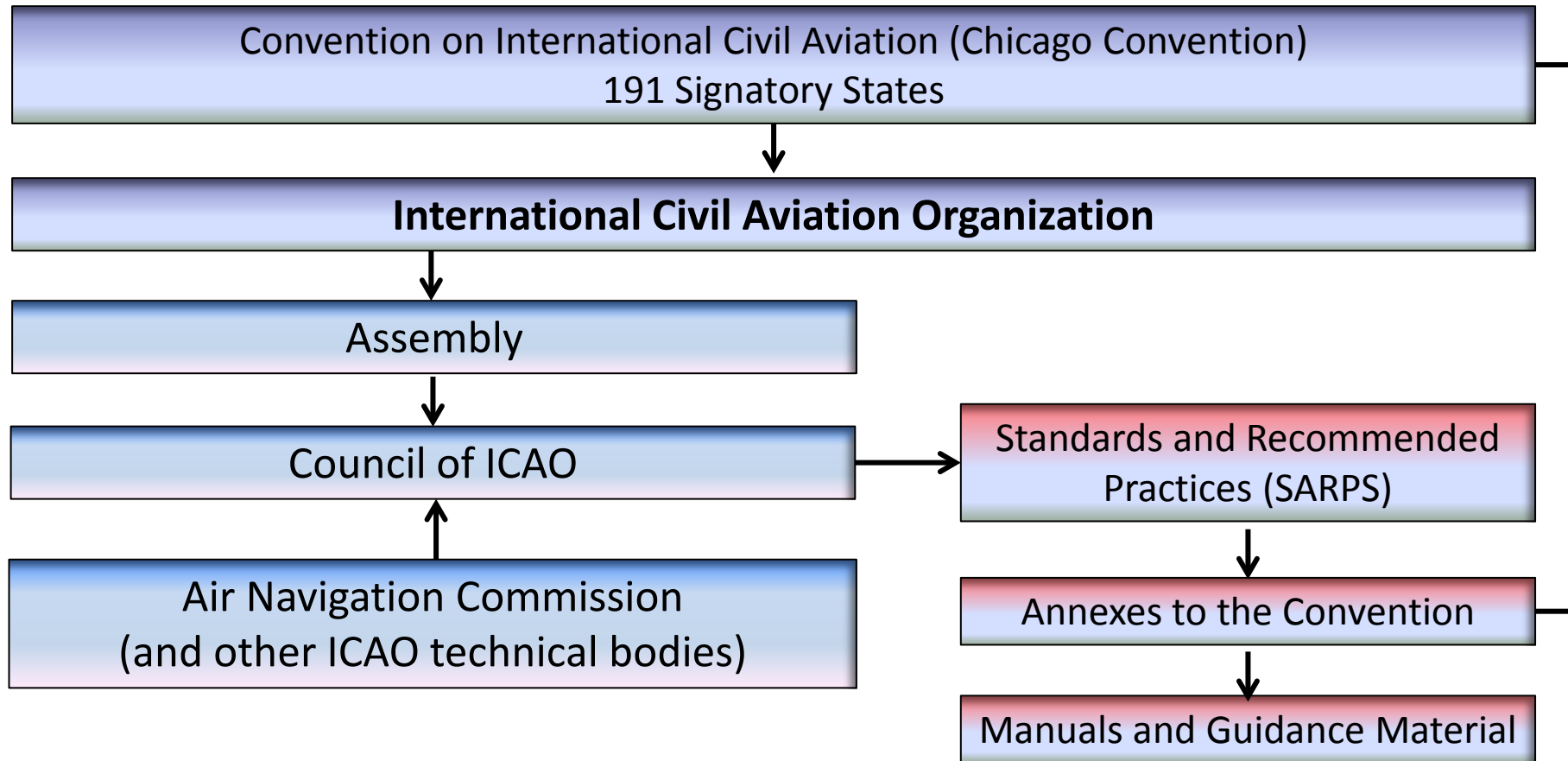


- International Civil Aviation Organization
 - Assembly
 - Sovereign body of ICAO
 - Representatives from all contracting States
 - Meets every 3 years
 - Reviews in detail the work of ICAO, sets policy, votes a triennial budget



- International Civil Aviation Organization
 - Council of ICAO
 - Governing body of ICAO
 - Continuing direction to the work of ICAO
 - Adopts SARPS
 - Assisted by the Air Navigation Commission (technical matters) and others

About ICAO



ICAO Regional Structure



ICAO Asia and Pacific Regions and APANPIRG

ICAO Regional Structure



- The ICAO Asia/Pacific Region
 - 38 States
 - 2 Special Administrative Regions of China
 - 49 Flight Information Regions (FIRs)
 - 2 FIRs of States accredited to other Regional Offices
 - USA (Oakland Oceanic FIR)
 - France (Tahiti FIR)
 - World's largest ICAO Region
 - Geographically
 - Passengers
 - Traffic movements?

ICAO Regional Structure



- **APANPIRG**

- **Asia/Pacific Air Navigation Planning and Implementation Regional Group**
 - (Every ICAO Region has a **PIRG**)
- Includes all Asia/Pacific Region ICAO Contracting States that:
 - Are service providers in the air navigation region; and
 - Are part of the region's Air Navigation Plan (ICAO Doc 9673)

ICAO Regional Structure



- APANPIRG

- Established by the ICAO Council in 1991
- *Guiding and coordinating organ for all activities conducted within ICAO concerning the Air Navigation System for the Asia and Pacific Regions.*

(APANPIRG Terms of Reference)

- More information:

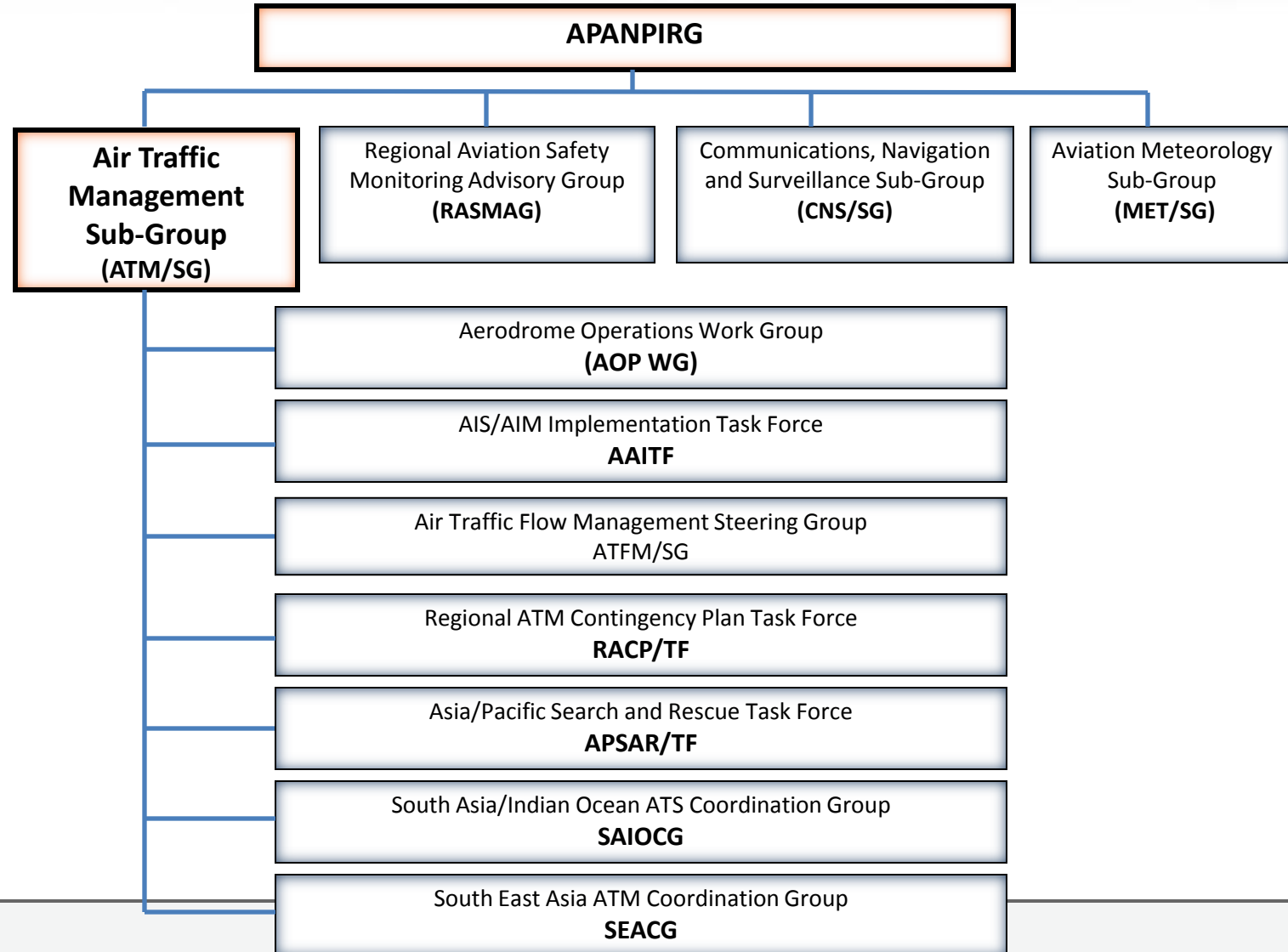
- ICAO Asia/Pacific Regional Office website
- <http://www.icao.int/APAC/Pages/APANPIRG-docs.aspx>

ICAO Regional Structure

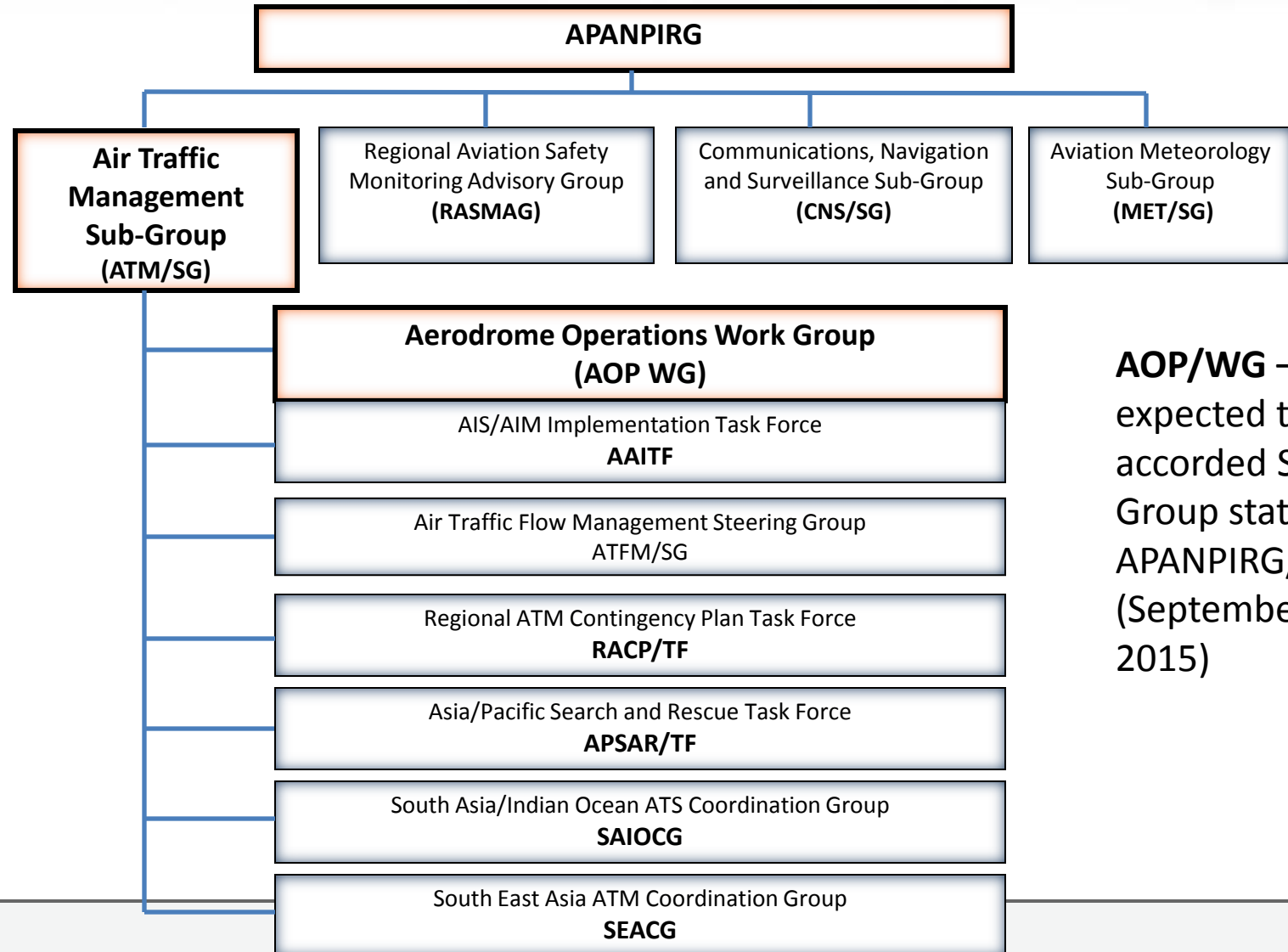


- APANPIRG or its Sub-Groups:
 - Appoint working groups and /or task forces
 - experts from the Group or the sub-group
 - perform studies
 - prepare supporting documentation on defined subjects
 - User States and other international organizations provide expert participants as required
 - Outcomes for consideration and approval by the Sub-Group, and APANPIRG

ICAO Regional Structure

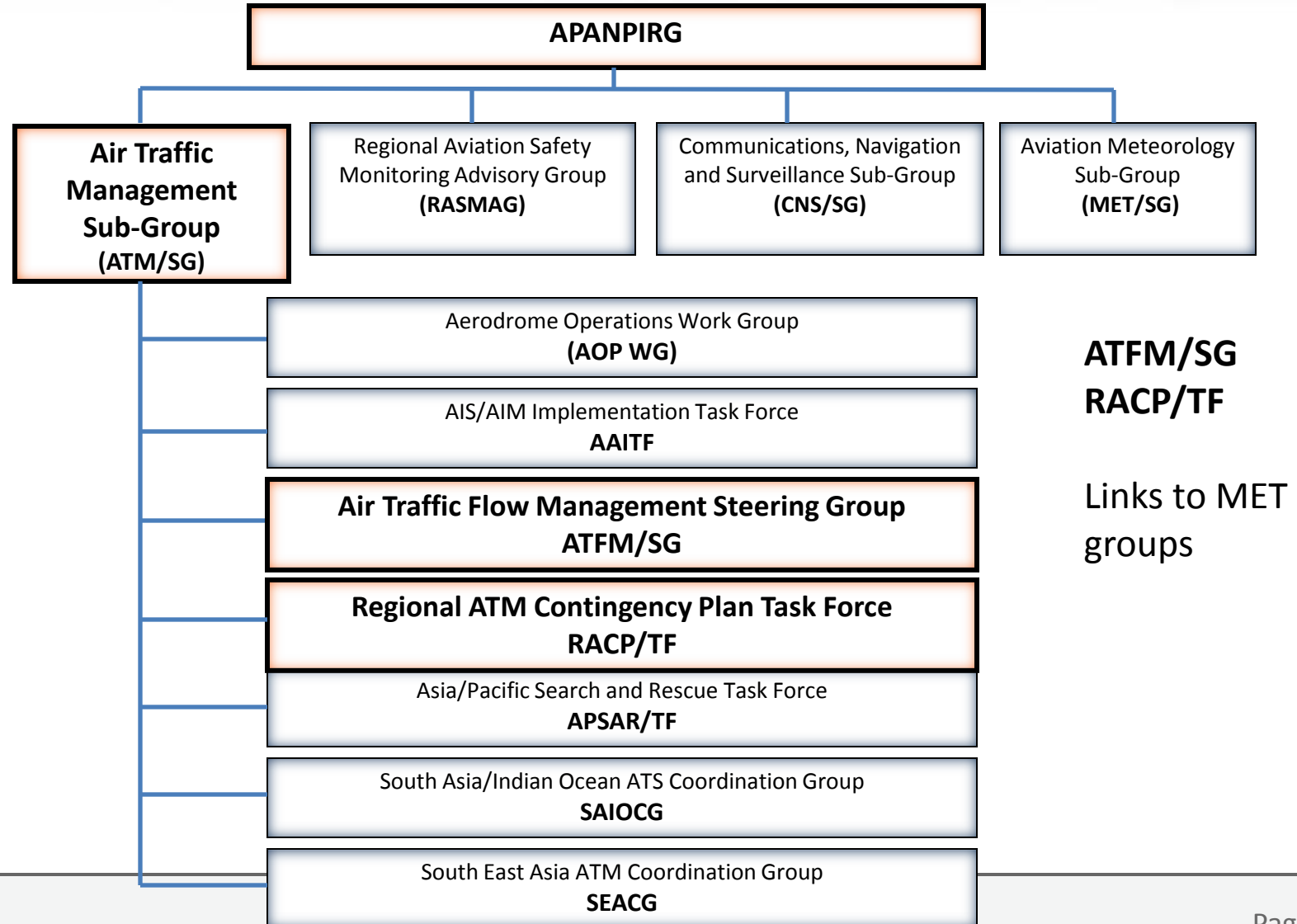


ICAO Regional Structure

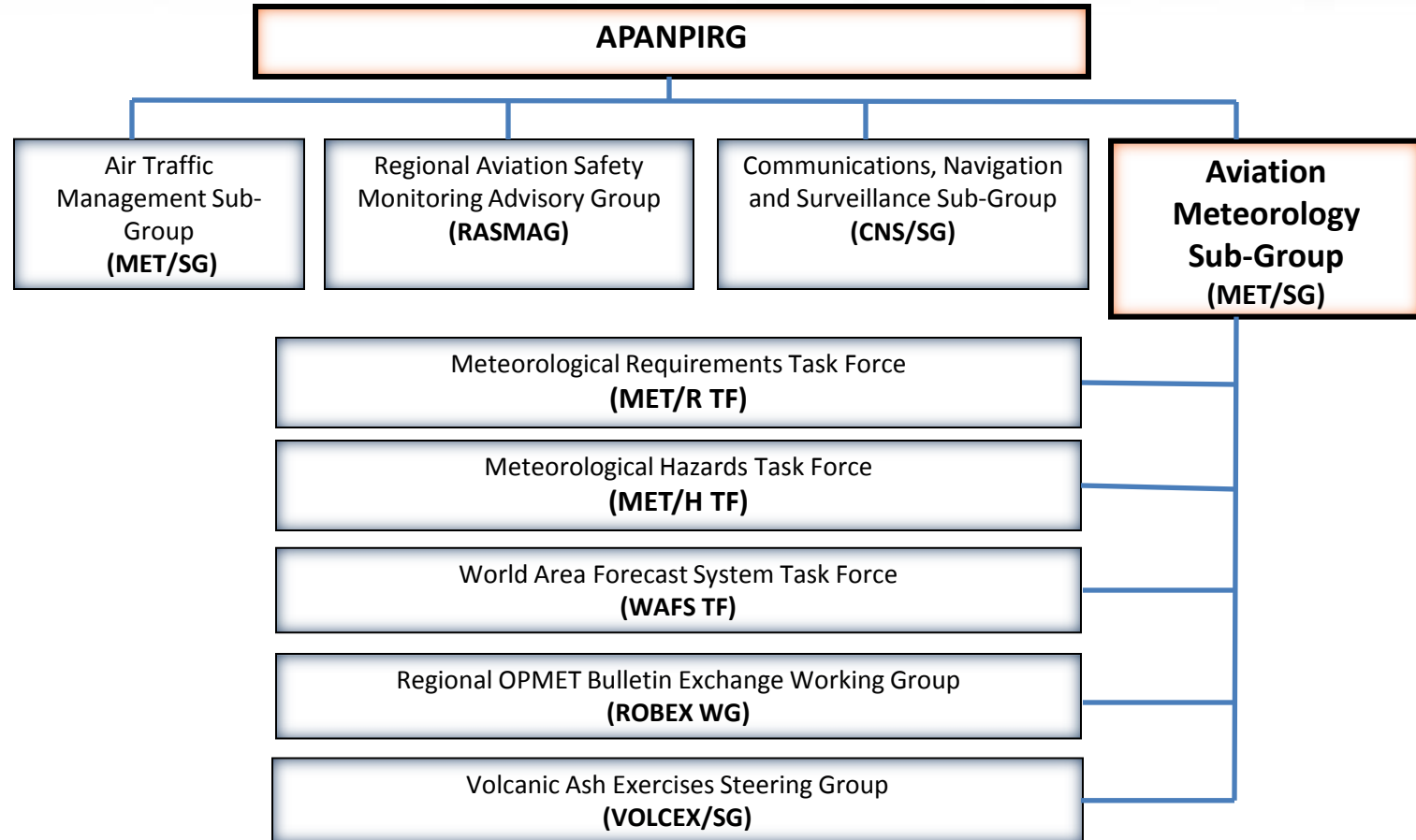


AOP/WG – expected to be accorded Sub-Group status by APANPIRG/26 (September 2015)

ICAO Regional Structure



ICAO Regional Structure

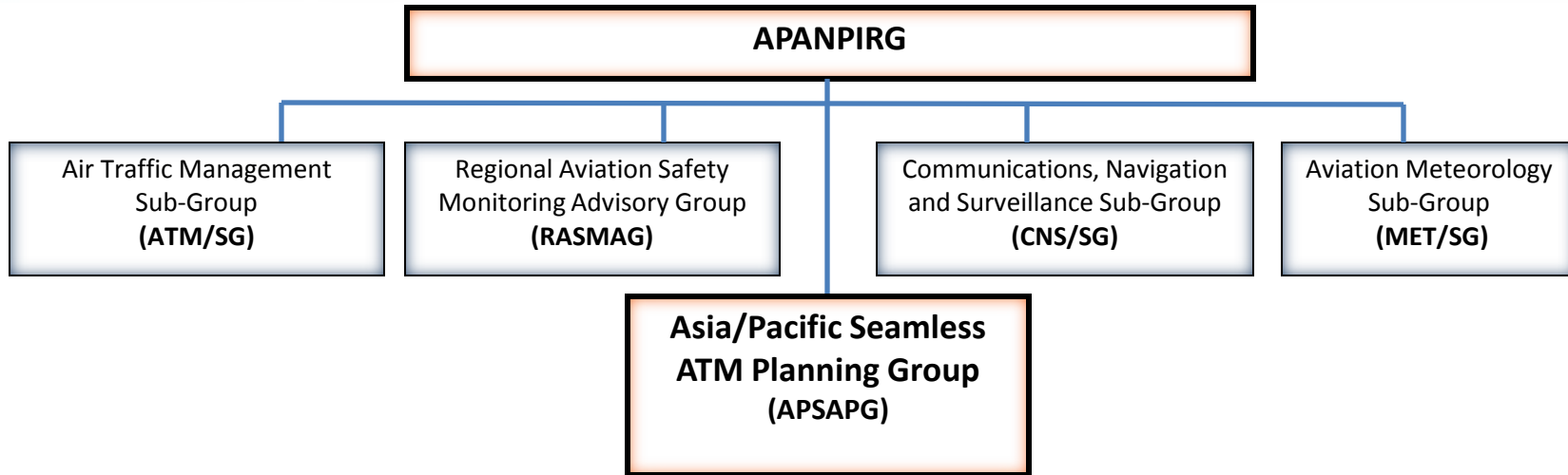


Asia/Pacific Seamless ATM Planning Group (APSAPG)

- History of APSAPG:
 - 46th Conference of Directors General of Civil Aviation
 - Asia and Pacific Regions
 - (DGCA/46, October 2009):
 - *Kansai Statement*

- History of APSAPG:
 - Kansai Statement – key points:
 - Recognized criticality of harmonization in civil aviation systems
 - Expectation of seamlessly flying between regions
 - Transparent and interoperable standards
 - Importance of “Seamless Sky” in Air Traffic Management, Aviation Security and Aviation Safety

- History of APSAPG:
 - Kansai Statement – key points:
 - Recognized the Global ATM Operational Concept (ICAO Doc 9854)
 - Necessity for active collaboration and participation
 - APANPIRG as the starting platform to:
 - discuss and plan the future ATM system of the Asia and Pacific Regions
 - include targets and a time schedule
 - APANPIRG/22 (September 2011):
 - Agreed to form **APSAPG**
 - Sub-Group Status (reporting direct to APANPIRG)



- Drivers for Seamless ATM Planning
 - Fragmented FIR structure
 - 50 FIRs of various sizes, reflecting national boundaries
 - Trajectory-based operations
 - Performance-based outcomes
 - Focus on customers using a business approach
 - Civil/military cooperation
 - Inflexible utilization of airspace
 - Insufficient airspace

- Drivers for Seamless ATM Planning
 - International cooperation
 - High growth in air traffic with conflicting user requirements
 - Rigid airspace configurations causing congestion
 - Address ground systems to improve capacity

Seamless ATM Plan

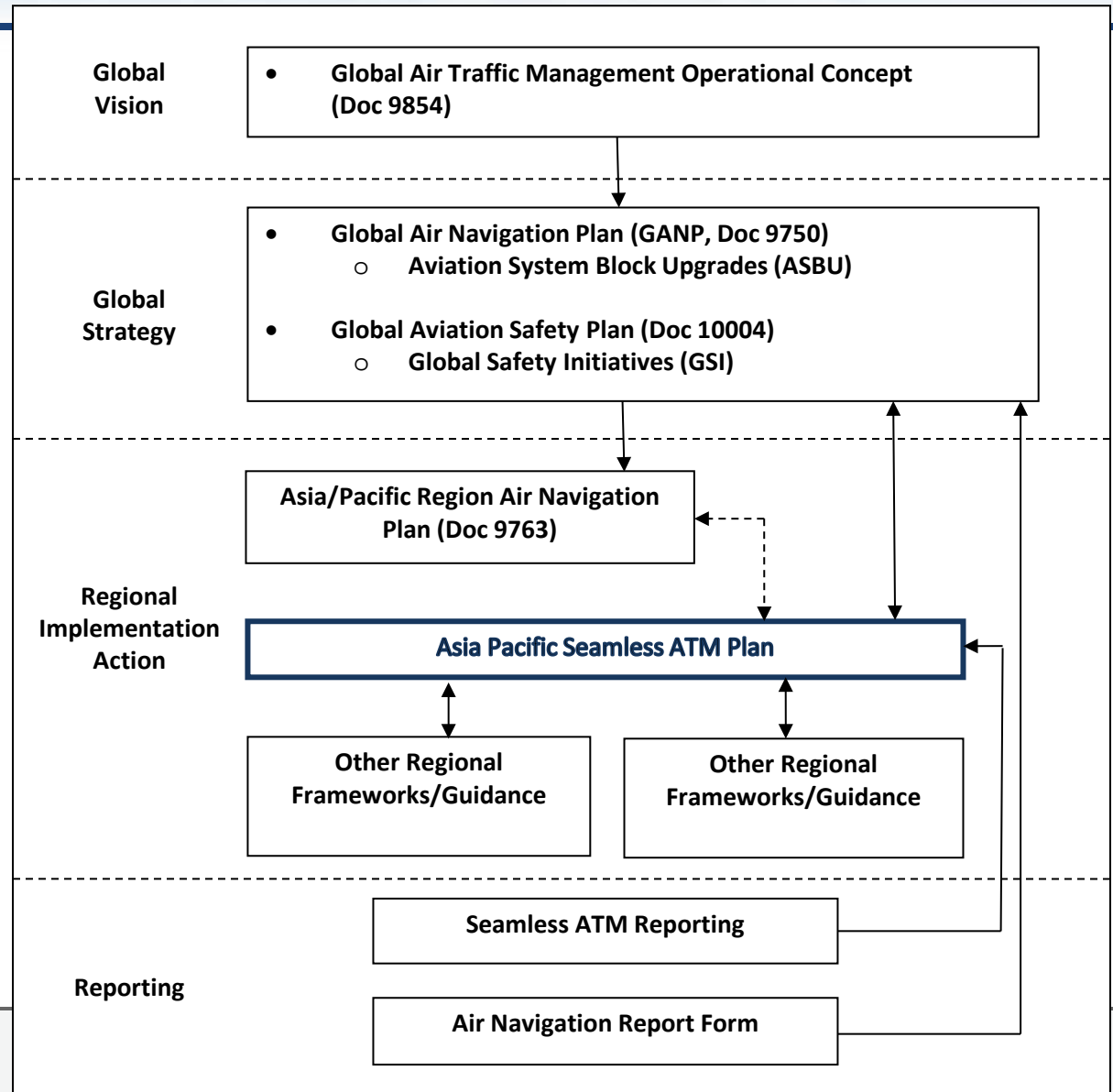


Asia/Pacific Seamless ATM Plan

Seamless ATM Plan



Hierarchy of Planning Documents:



Seamless ATM Plan



- Seamless ATM Definition
 - A safe and interoperable provision of harmonized and consistent air traffic management service provided to a flight, appropriate to the airspace category and free of transitions due to a change in the air navigation service provider or Flight Information Region. (APSAPG)

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

Seamless ATM Plan



- Objectives
- Set minimum requirements for seamless gate-to-gate ATM operations – an efficiency focus for passengers and aircraft in Asia-Pacific
- Implement selected Aviation System Block Upgrade (ASBU) elements in the Asia/Pacific Region.
- Address trans-regional issues
 - Europe – Asia/Pacific
 - Middle East/Africa – Asia

Seamless ATM Plan



- Objectives
- 42 objectives, 2 phases
 - Phase I November 2015
 - Phase II November 2018
 - Aligned with ASBU Block 0 timeline
- Addressed in *Performance Improvement Plan*
 - Preferred Aerodrome/Airspace and Route Specifications (PARS) Phases I and II
 - Preferred ATM Service Levels (PASL) Phases I and II

Seamless ATM Plan



- Performance Objectives (Directly MET-related)
 - Defined under Performance Improvement Plan
 - PARS Phase I (Implementation by Nov. 2015)

7.39 ATM systems should be supported by implementation of appropriate meteorological information reporting systems, providing inter alia observations, forecasts, warnings and alerts, and also provide for information to meteorological authorities or offices where required.

Seamless ATM Plan



- Performance Objectives (Directly MET-related)
 - Defined under Performance Improvement Plan
 - PASL Phase I (Implementation by Nov. 2015)

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

Note: High density aerodromes are defined in the Seamless ATM Plan as those with 100,000 scheduled movements per annum or more, except where the State establishes more stringent criteria or requirements

Seamless ATM Plan

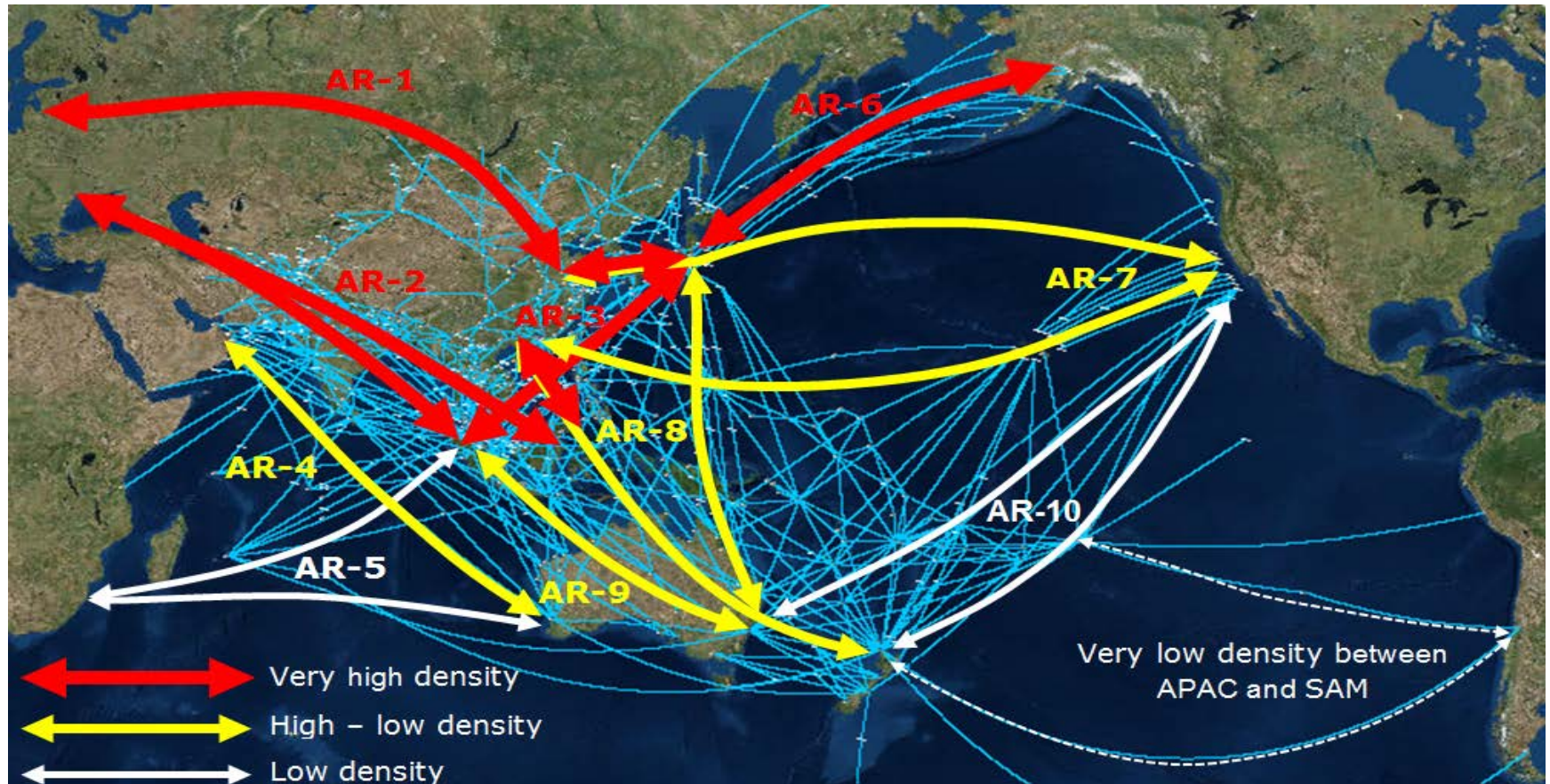


- Performance Objectives (Where MET information may be required for support)
 - Defined under Performance Improvement Plan
 - PARS Phase I (Implementation by Nov. 2015)

7.2 All high density international aerodromes should operate an Airport Collaborative Decision-Making (A-CDM) system serving the Major Traffic Flows (MTF) and busiest city pairs, with priority implementation for the busiest Asia/Pacific aerodromes.

Note: MTF, previously defined in ICAO Doc 9750 – Global Air Navigation Plan, are under review before being included in the Regional Air Navigation Plan.

Major Traffic Flows



Busiest City Pairs



- Based on 2012 ICAO Data the 21 busiest Asia/Pacific Aerodromes were:
 - Australia (Sydney, Melbourne);
 - China (Beijing, Shanghai Pudong and Hong Jiao, Guangzhou, Hong Kong, Xi'an, Shenzhen, Chengdu, Kunming);
 - India (New Delhi, Mumbai);
 - Indonesia (Jakarta);
 - Japan (Haneda, Narita);
 - Malaysia (Kuala Lumpur);
 - Philippines (Manila);
 - Republic of Korea (Incheon);
 - Singapore (Changi); and
 - Thailand (Suvarnabhumi).

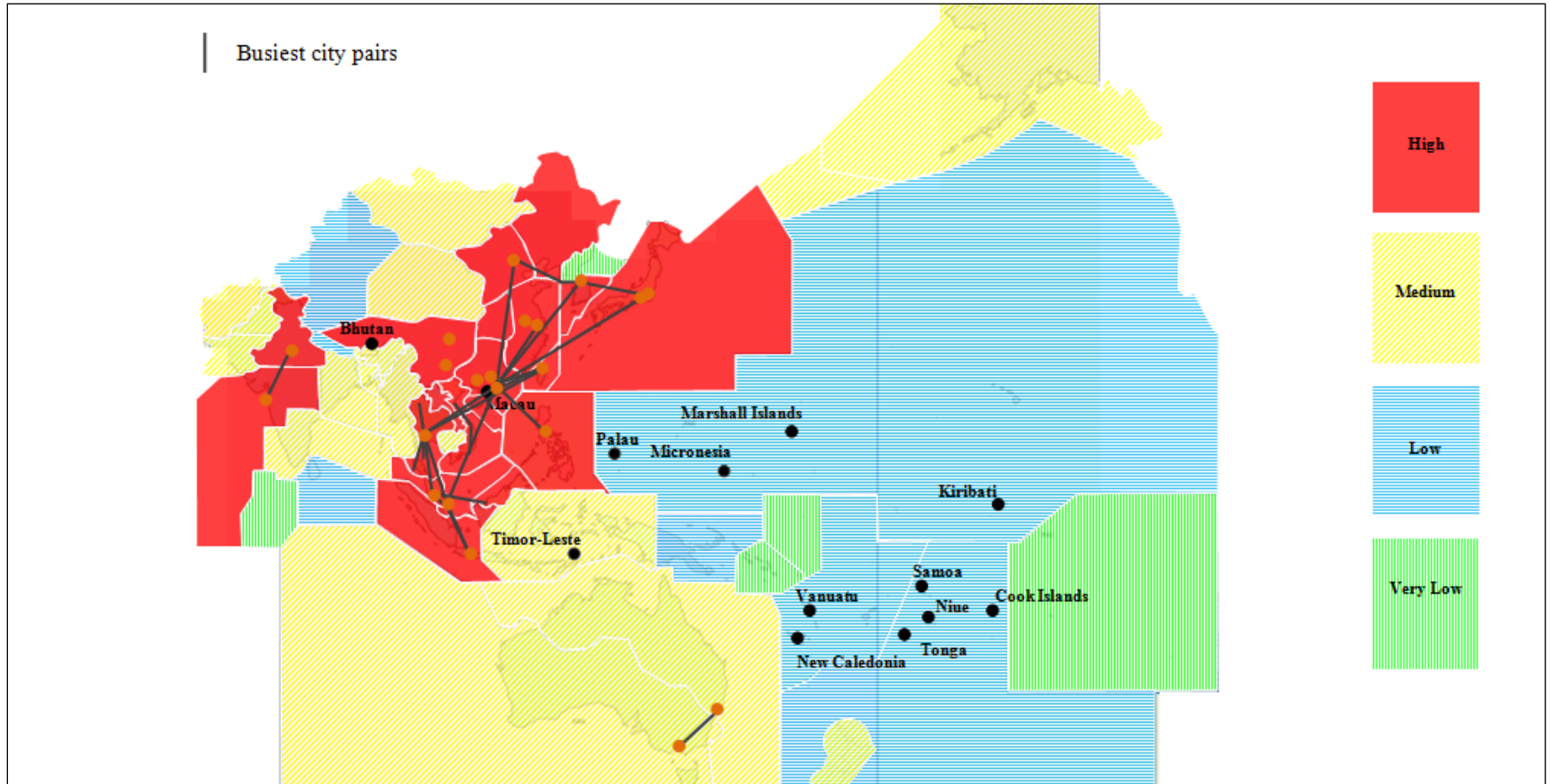
Seamless ATM Plan



- **Performance Objectives** (Where MET information may be required for support)
 - Defined under Performance Improvement Plan
 - PASL Phase I (Implementation by Nov. 2015)

7.27 High Density FIRs supporting the busiest Asia/Pacific traffic flows and high density aerodromes should implement air traffic flow management (ATFM) incorporating collaborative decision-making (CDM) to enhance capacity, using bilateral and multi-lateral agreements.

High Density FIRs



Seamless ATM Plan



- **Performance Objectives** (Where MET information may be required for support)
 - Defined under Performance Improvement Plan
 - PASL Phase I (Implementation by Nov. 2015)

7.27 High Density FIRs supporting the busiest Asia/Pacific traffic flows and high density aerodromes should implement air traffic flow management (ATFM) incorporating collaborative decision-making (CDM) to enhance capacity, using bilateral and multi-lateral agreements.

Seamless ATM Plan



- Performance Objectives (Where MET information may be required for support)
 - Defined under Performance Improvement Plan
 - PARS Phase II (Implementation by Nov. 2018)

7.47 All FIRs supporting Major Traffic Flows (MTF) should implement ATFM incorporating CDM to enhance capacity, using bi-lateral and multi-lateral agreements.

Asia/Pacific Air Traffic Flow Management Steering Group (ATFM/SG) A little history.....

- APANPIRG/24
(June 2013)



Twenty Fourth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/24)
ICAO Regional Office, Bangkok, Thailand, 24-26 June 2013



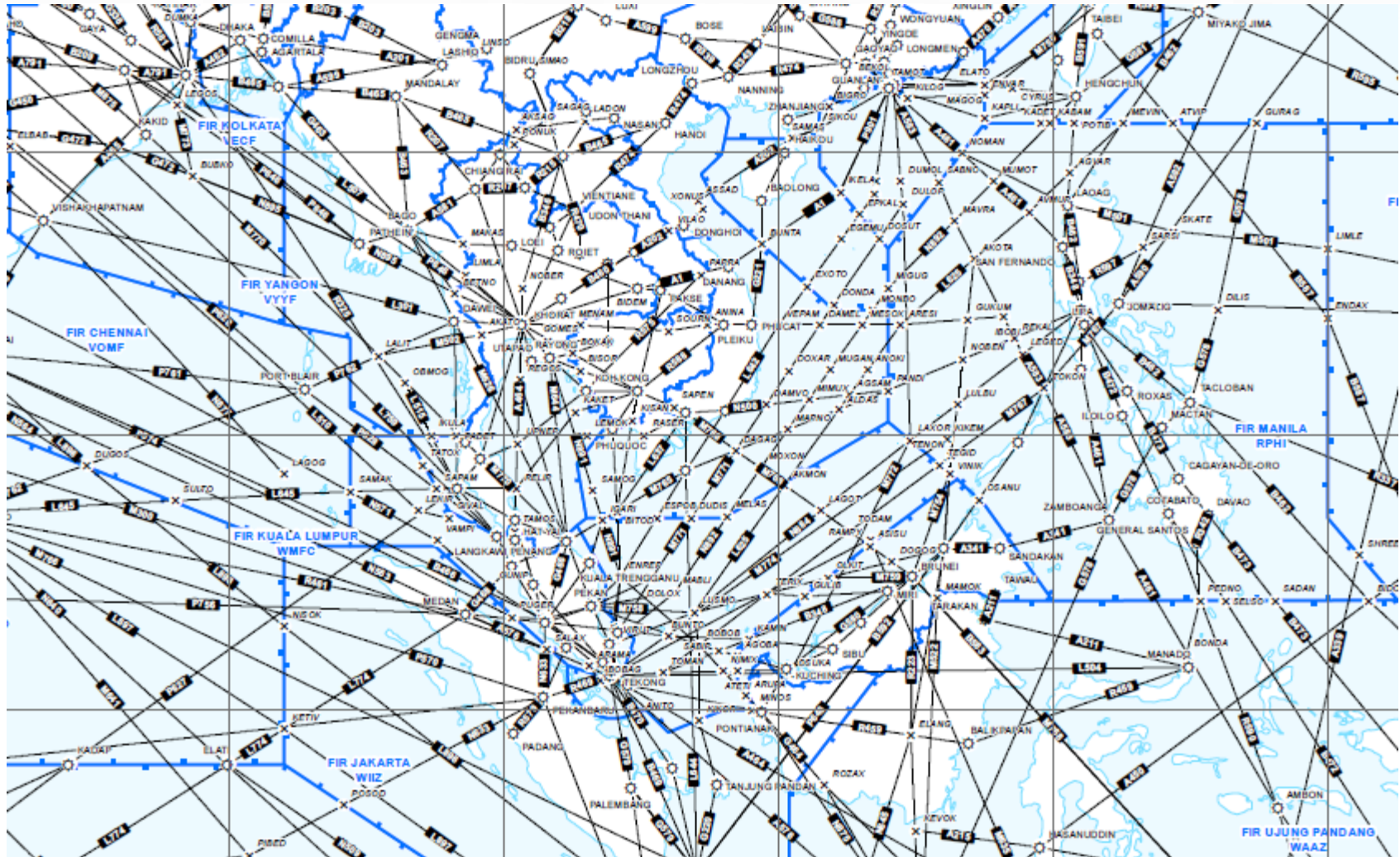
- Adopted the Asia/Pacific Seamless ATM Plan

- APANPIRG/24 (June 2013)
 - Considered ATFM needs in APAC Region
 - Relatively small S.E. Asia FIRS, low flight transit times
 - Flow management based on local actions restricting traffic volumes
 - Network-based ATFM as a key element of ASBU Block 0
 - *ASBU Priority 1 - Critical upgrade* element of the Seamless ATM Plan

ATFM/SG



ATFM/SG



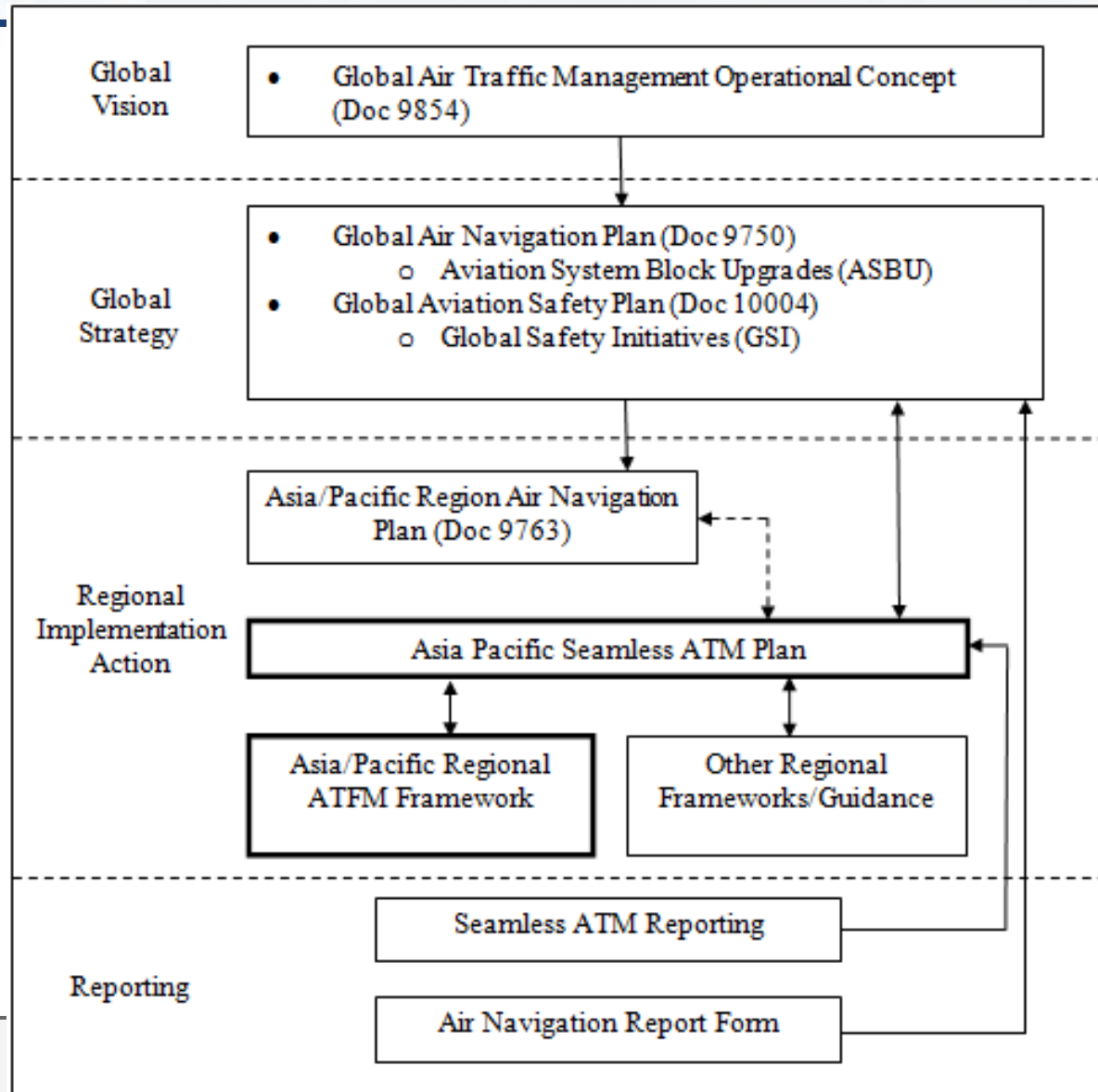
- APANPIRG/24 (June 2013)
 - Considered ATFM needs in APAC Region
 - Noted the impracticability of a centralized ATFM approach for APAC
 - More pragmatic to support sub-regional multi-State programs
 - Adopted several ATFM related conclusions

- APANPIRG/24 (June 2013)
 - **Conclusion 24/15:** Asia/Pacific ATFM Steering Group

*That, States participate in, and support the Asia/Pacific ATFM Steering Group to **develop a common Regional ATFM framework**, which addresses ATFM implementation and ATFM operational issues in the Asia/Pacific region*

Draft Regional Framework for Collaborative ATFM

DRAFT Regional ATFM Framework



DRAFT Regional ATFM Framework



- Alignment of ATFM Framework and Seamless ATM Plan
 - Seamless ATM Plan
 - sets the overarching requirements for ATFM in the Asia/Pacific Region
 - Regional Framework based on Seamless ATM Plan
 - Structure
 - Objectives
 - Principles
 - Implementation timelines

DRAFT Regional ATFM Framework



- Regional Priorities and Targets - APANPIRG/25

By November 2015	
PRIORITY	Mapped to ASBU
PBN	B0-APTA Optimization Of Approach Procedures Including Vertical Guidance
Network Operations	B0-NOPS Improved Flow Performance Through Planning Based On A Network-Wide View
Aeronautical Information Management	B0-DATM Service Improvement through Digital Aeronautical Information Management
Flight and Flow Information for a Collaborative Environment (FF-ICE)	B0-FICE Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration
Civil Military	B0-FRTO Improved Operations through Enhanced Enroute Trajectories

DRAFT Regional ATFM Framework



- Regional Priorities and Targets - APANPIRG/25

By November 2015	
PRIORITY	MAPPED to ASBU
Civil/Military	Tactical Civil-Military coordination (Regional priority)
Civil/Military	Strategic Civil-Military coordination (Regional priority)
Ground Surveillance	B0-ASUR Initial Capability For Ground Surveillance (ADS-B Implementation)
Ground Surveillance	B0-ASUR Initial Capability For Ground Surveillance (Surveillance Coverage)
Trajectory-based Operations – Data-Link En-Route	B0-TBO - Improved Safety and Efficiency through the initial application of Data Link En-Route

DRAFT Regional ATFM Framework



- ATFM Framework Document Structure
 - Regional Framework for Collaborative ATFM
 - Scope
 - Objectives
 - Executive Summary
 - Abbreviations and Acronyms
 - Background Information (Principles, Elements)

DRAFT Regional ATFM Framework



- ATFM Framework Document Structure
 - Regional Framework for Collaborative ATFM
 - Current Situation
 - **Performance Improvement Plan**
 - Research, Development and Future Possibilities
 - Milestones, Timelines, Priorities, Actions
 - Appendices

DRAFT Regional ATFM Framework



- Performance Improvement Plan
 - MET-related performance objectives:
 - REGIONAL ATFM CAPABILITY PHASE IA
 - *Expected implementation by 12 November 2015*
 - 7.8 Daily pre-tactical airport and airspace capacity and demand analysis should be conducted for all ATFM Program Airports and associated terminal area airspace, and for all en-route ATC sectors supporting the busiest Asia/Pacific city pairs, including consideration of:
 - expected runway and airspace configurations;
 - forecast meteorological phenomena;
 - ATC resources, facilities and equipment;
 - other known or expected capacity constraints; and
 - updated flight schedule and flight plan information.

DRAFT Regional ATFM Framework



- Performance Improvement Plan
 - MET-related performance objectives:
 - REGIONAL ATFM CAPABILITY PHASE II
 - *Expected implementation by 08 November 2018*
 - 7.31 Meteorological services for the terminal area (MSTA) should be implemented, including near-term or *now-casting* forecasts of convective weather activity at or affecting ATFM Program Airports and associated instrument approach procedures, terminal area ATS routes and holding points and other significant locations.

- Meteorological Services for the Terminal Area
 - Current Annex 3 provisions:
 - No current provision for MET information specifically supporting determination of weather impact on airport/airspace capacity
 - OPMET information typically ATS and/or pilot oriented
 - Limited use in ATFM
 - No detailed forecasting for critical points affecting airport/airspace capacity (IAF, holding stacks, STARs)

- Meteorological Services for the Terminal Area
 - State implementation:
 - Some States have implemented MET information specifically supporting ATFM
 - Independently developed according to State need and capability

- Meteorological Services for the Terminal Area
 - What's needed
 - Regional guidance for near-term (now-casting) forecasts of convective weather for MSTA; and
 - other future en-route ATC sector requirements;
 - To be discussed at MET/R TF/4



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(SAM) Office
Lima

ICAO
Headquarters
Montreal

Western and
Central African
(WACAF) Office
Dakar

European and
North Atlantic
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Paris

Middle East
(MID) Office
Cairo

Eastern and
Southern African
(ESAF) Office
Nairobi

Asia and Pacific
(APAC) Office
Bangkok

Thank You

A world map is shown in a light blue color. Eight dots are placed on the map, each connected by a thin line to a text label describing an ICAO office. The labels are: North American Central American and Caribbean (NACC) Office Mexico City; South American (SAM) Office Lima; ICAO Headquarters Montreal; Western and Central African (WACAF) Office Dakar; European and North Atlantic (EUR/NAT) Office Paris; Middle East (MID) Office Cairo; Eastern and Southern African (ESAF) Office Nairobi; and Asia and Pacific (APAC) Office Bangkok. A large, semi-transparent blue box with rounded corners is overlaid on the map, containing the text "Thank You" in a bold, white font.