



SIP/2004-WP7
Business case

Special Implementation Project

CNS/ATM Systems – Planning and Implementation

(Presented by H.V.SUDARSHAN)

Workshop on the development of business case for the
implementation of CNS/ATM systems
Cairo, 6–9 September 2004



Approach to presentation

- **Planning by partners**
- **Global/Regional/National level**
- **Subregional/Multinational approach**
- **Interregional planning**
- **Major air traffic flows**
- **Homogeneous ATM areas**
- **An update on planning**



Planning for CNS/ATM systems by the partners ...

CNS/ATM Partners	Planning Levels	Deliverables	Guidance
ICAO	Global	Global plan	ICAO policy
Regional planning groups	Regional	Regional plan	Global plan
Subregional planning groups	Subregional	Subregional plan	Regional plan
States	National	National plan	Regional plan

(1/2)



Planning for CNS/ATM systems by the partners

CNS/ATM Partners	Planning Levels	Deliverables	Guidance
Airspace users	Regional, national	User-driven plan	Regional and national plans
Service providers	Global, regional, national	Service-provider plan	Global, regional and national plans
Industry	Global, regional, national	Manufacturer plan	Global, regional and national plans



Council

Air Navigation Commission

User requirements
Operator requirements
ATS provider requirements
EUROCAE
RTCA

Other ANC panels

ATMCP

ATM OPERATIONAL CONCEPT

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Global Planning

- ◆ Global Air Navigation Plan
- ◆ Standards and Recommended Practices
- ◆ Procedures and Air Navigation Services
- ◆ Manuals and circulars

User needs

ATM requirements

Validation

ATM system requirements

Regional Planning

Regional Air Navigation Plans

- APANPIRG (ASIA/PAC)
- APIRG (AFI)
- EANPG (EUR)
- GREPECAS (CAR/SAM)
- MIDANPIRG (MID)
- NATSPG (NAT)
- NAMPG (NAM)

Air traffic forecasts

National Planning

National Plans

- National Architecture
- National Architecture
- National Architecture
- National Architecture

ATM requirements

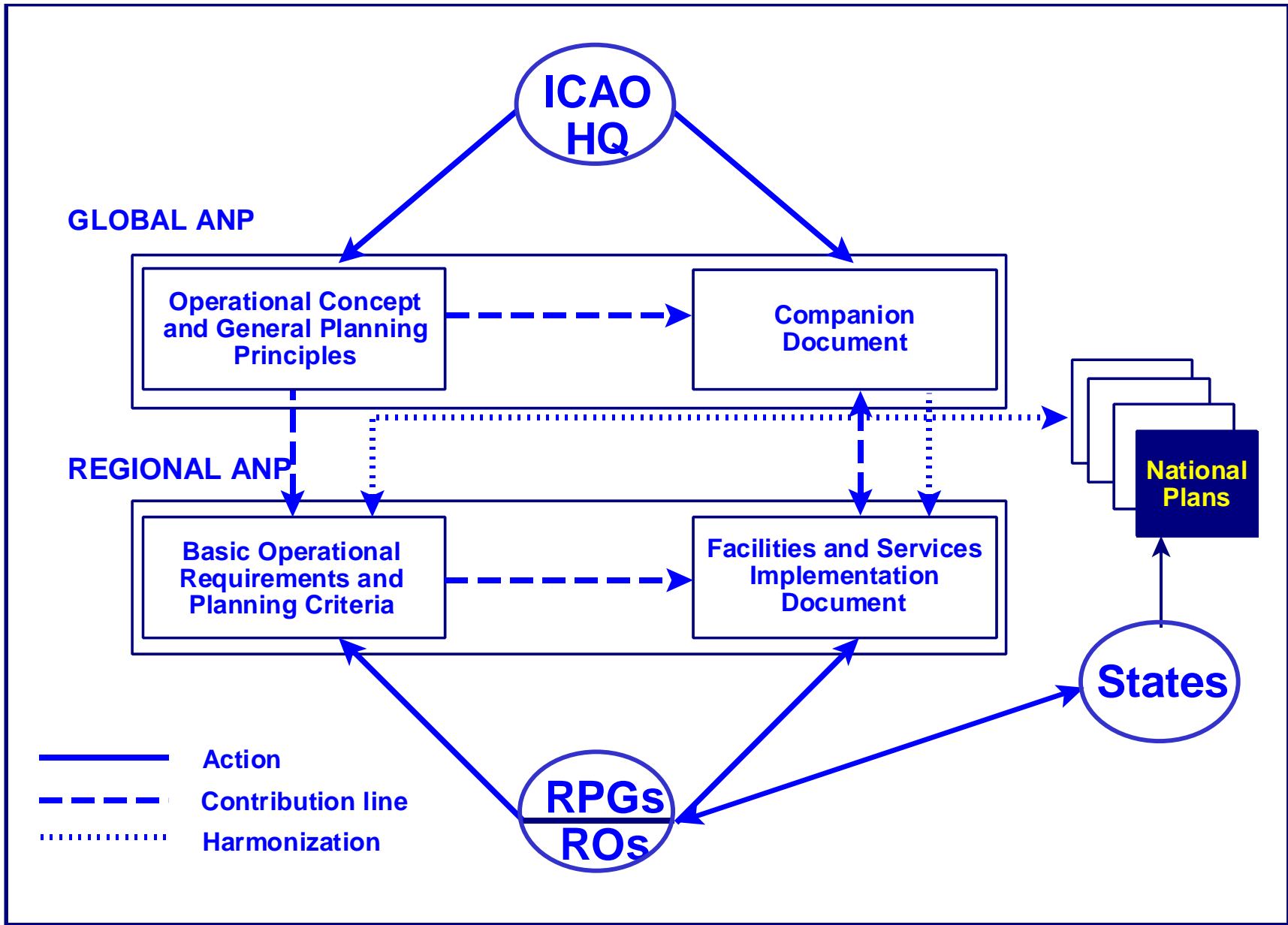
ATM requirements

◆ = regional air navigation plan

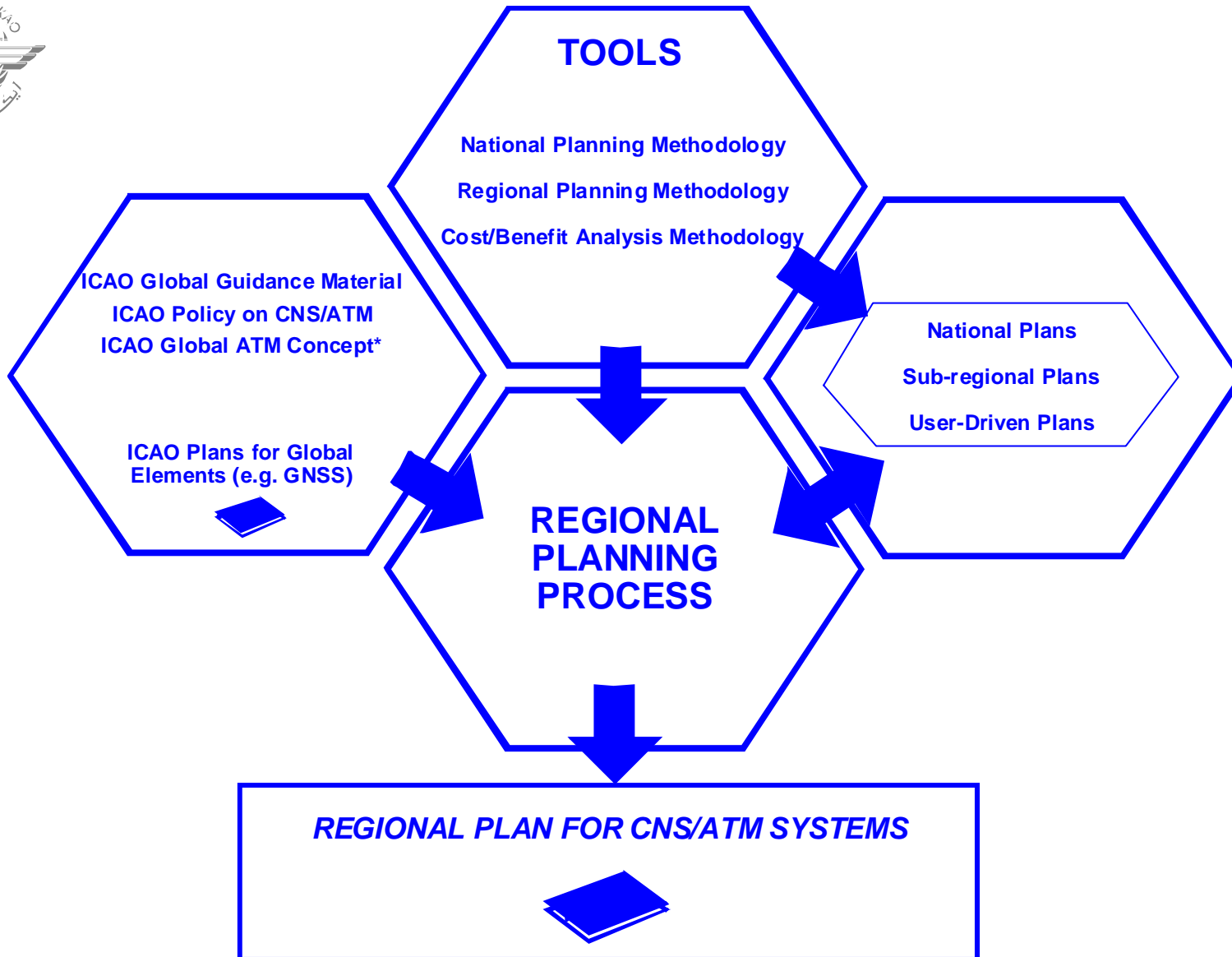
◆ = regional air navigation plan

ICAO ATM PLANNING PROCESS

ATM OPERATIONAL CONCEPT



Relationship between the Global Plan, regional ANPs and national plans



Regional planning mechanism



GLOBAL GUIDANCE
*Global Air Navigation Plan for CNS/ATM Systems,
SARPs, PANS, Guidance Material*



Regional Requirements

APANPIRG (ASIA/PAC)

APIRG (AFI)

EANPG (EUR)

GREPECAS (CAR/SAM)

MIDANPIRG (MID)

NATSPG (NAT)

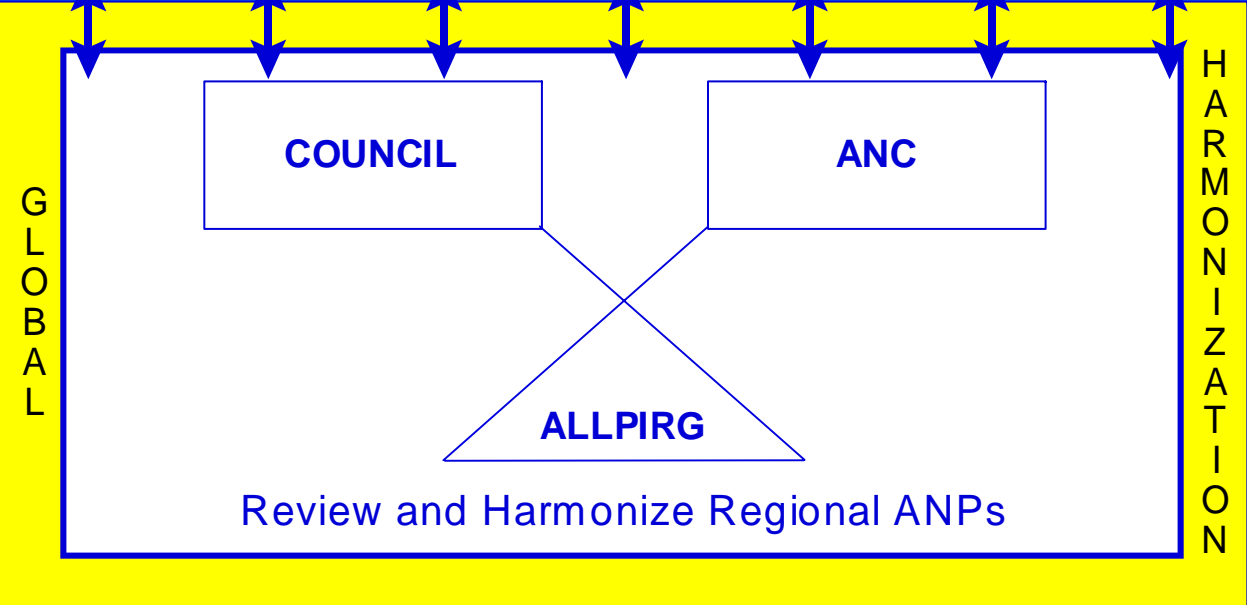
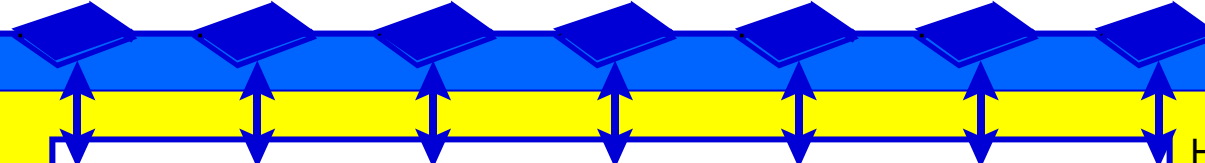
NAMPG (NAM)

National Plans



REGIONAL PLANNING GROUPS
Develop and Maintain Regional ANPs

Air Traffic Forecasts



Interregional coordination



Characteristics of a subregional/ multinational approach ...

- **Calls for political will**
- **Common goals in terms of ATM objectives and/or CNS requirements**
- **Not necessarily adjoining or cross-border**
- **Provides integration, rationalization and harmonization of systems and procedures**
- **Reduces equipage and maintenance costs**
- **Facilitates financing**

(1/3)



Characteristics of a subregional/ multinational approach ...

- Envelops multiple States/regions
- Infrastructure establishment by a multinational group, service providers or State(s)
- Operational management rests with multinational group, service providers or State(s)
- Better utilization of combined and unified airspace

(2/3)



Characteristics of a subregional/ multinational approach

- **Early benefits to airspace users and States**
- **Lends itself to a business case**
- **User charges is one means of cost recovery; will also serve as a source of repayment**
- **Possible to establish joint charges collection agency**

(3/3)



Transition plan for CNS/ATM systems

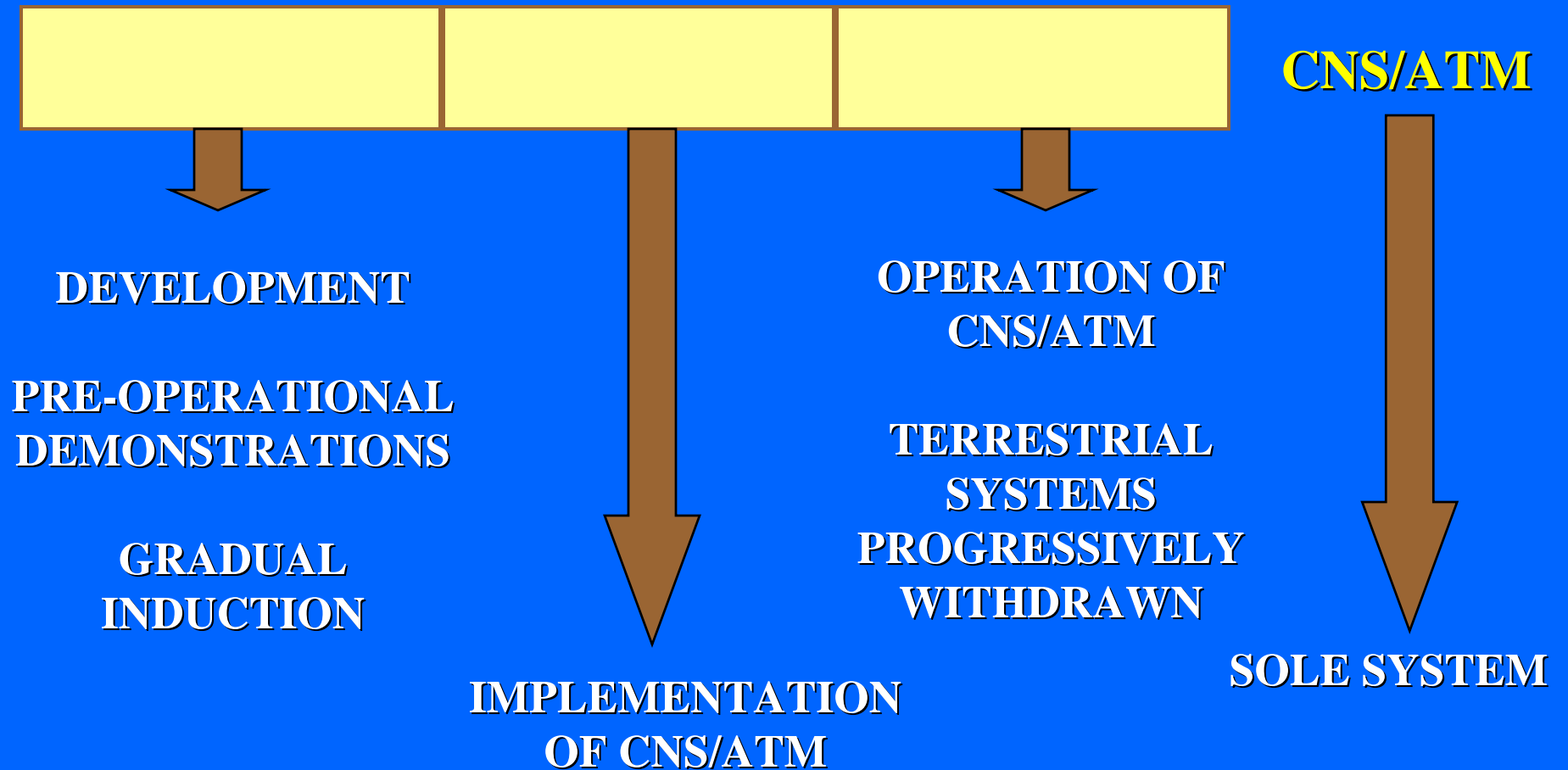
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2000

2005

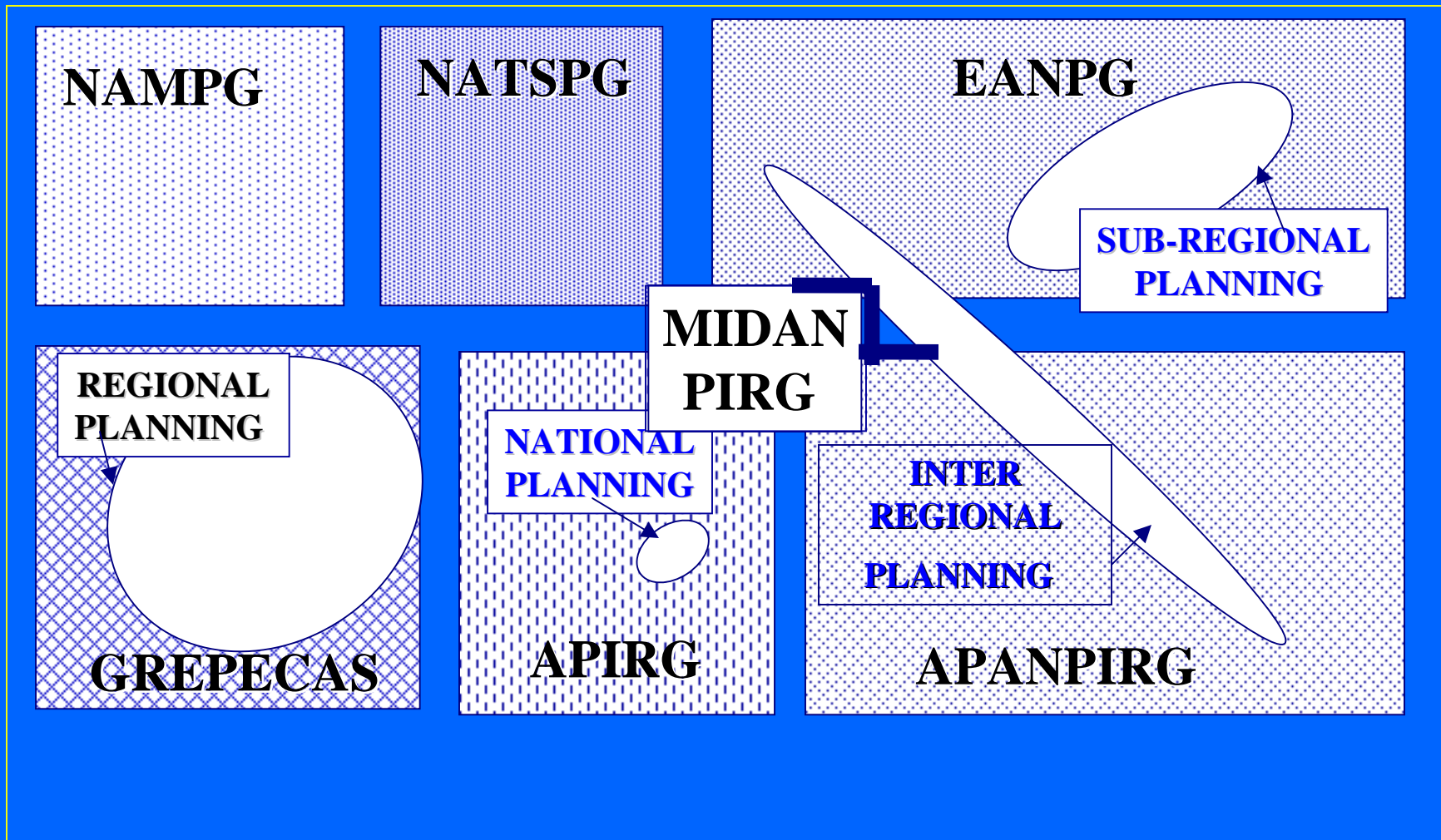
2010

CNS/ATM





Interregional planning



“Interface” issues



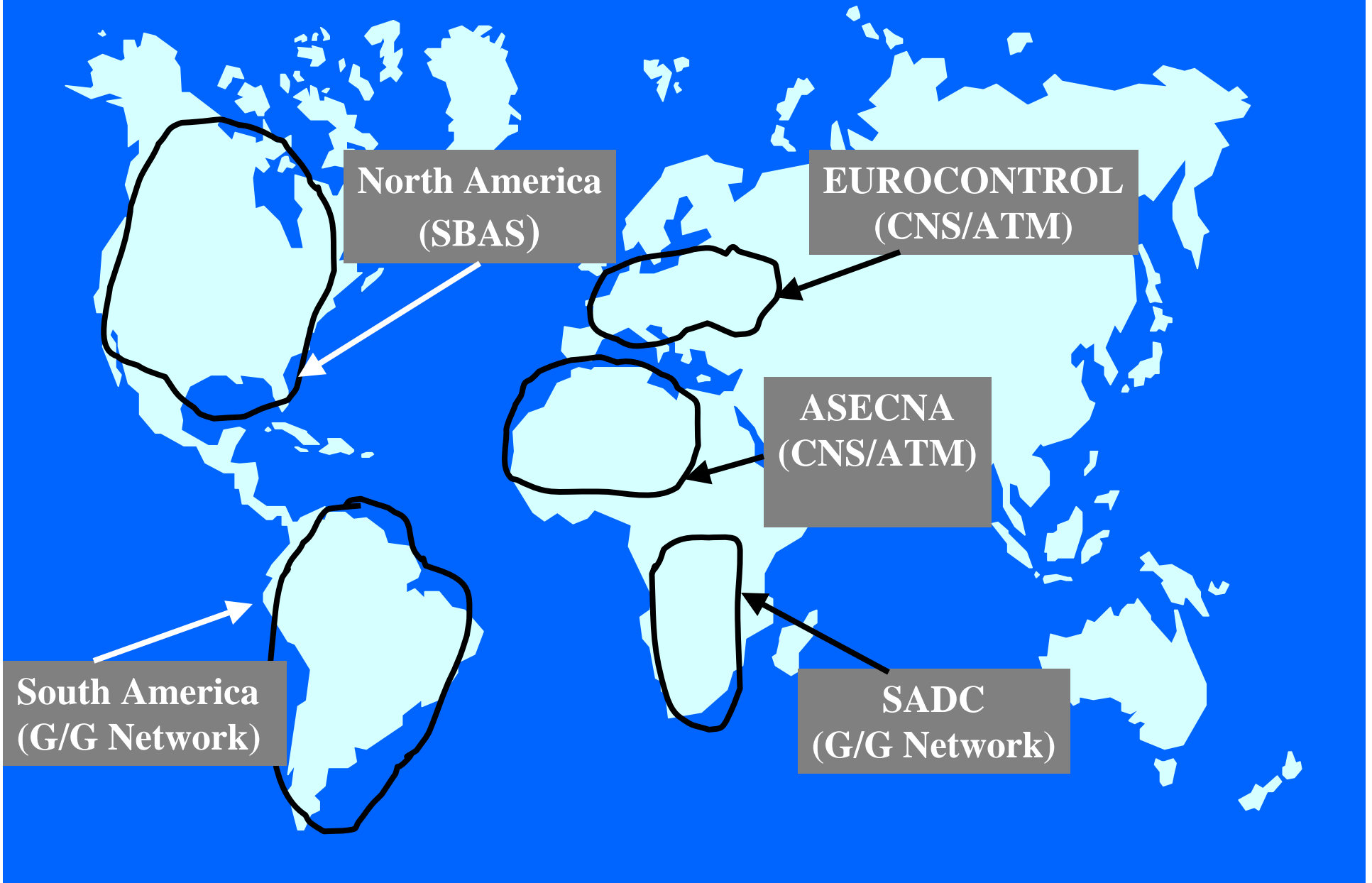
Planning based on homogeneous ATM areas and major traffic flows ...

Homogeneous ATM areas

An airspace with a common ATM interest based on similar characteristics of traffic density, complexity, air navigation infrastructure requirements or other specified considerations, wherein a common detailed plan fosters the implementation of interoperable CNS/ATM systems.

They may extend over States, specific portions of States or groupings of smaller States. They may include large oceanic and continental en route areas.

Homogeneous ATM areas – some examples





Planning based on homogeneous ATM areas and major traffic flows

Major traffic flows

Major traffic flow: A concentration of significant volumes of air traffic on the same or proximate flight trajectories.

Note: Major traffic flows may cross several homogeneous ATM areas with different characteristics

Routing area: A defined area encompassing one or more major traffic flows



World major traffic flows – example





Characteristics of the major traffic flow approach ...

- **May include various types of airspace; oceanic, continental en route and terminal areas**
- **Common goals in terms of ATM objectives and/or CNS requirements**
- **Early benefits to airspace users and States**

(1/5)



Characteristics of the major traffic flow approach ...

- **Envelops multiple States and/or regions**
- **Involves consideration of air navigation infrastructure, traffic density and airspace users' needs**
- **Necessarily adjoining or cross-border for it to be a part of the traffic flow**
- **Has interoperable CNS systems**

(2/5)



Characteristics of the major traffic flow approach ...

- **Absorbs gate-to-gate concept**
- **Establishment of infrastructure could be by a multinational group, ANS provider or State(s)**
- **Provides integration, rationalization and harmonization of systems and procedures**



Characteristics of the major traffic flow approach ...

- **Facilitates financing**
- **Operational management rests with multinational group, ANS providers or State(s)**
- **Lends itself to a business case; consequently, it is easier to fund the project**



Characteristics of the major traffic flow approach

- **User charges is one of the means of cost recovery and will also serve as a source of repayment**
- **Possible to establish a joint charges collection agency**

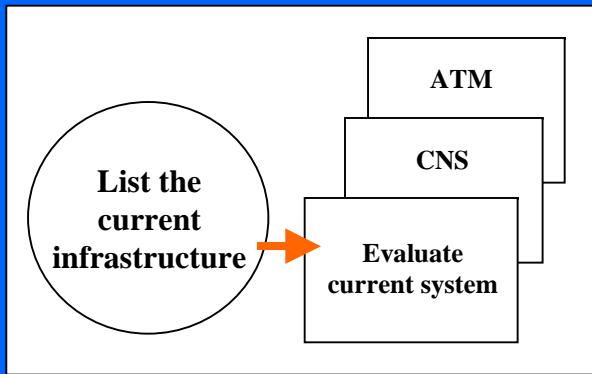
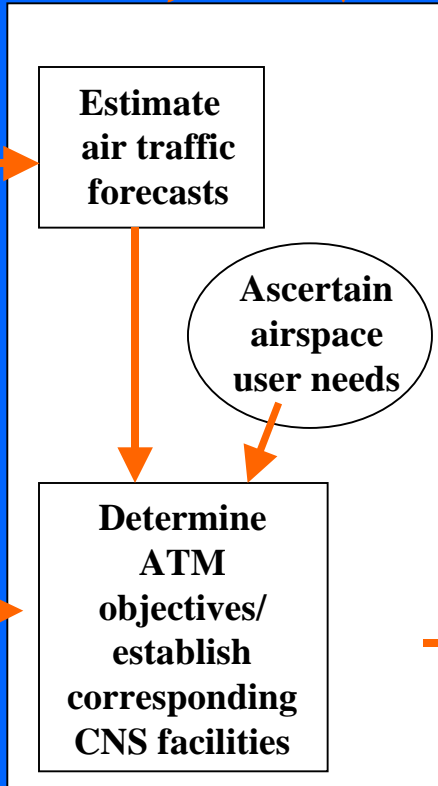
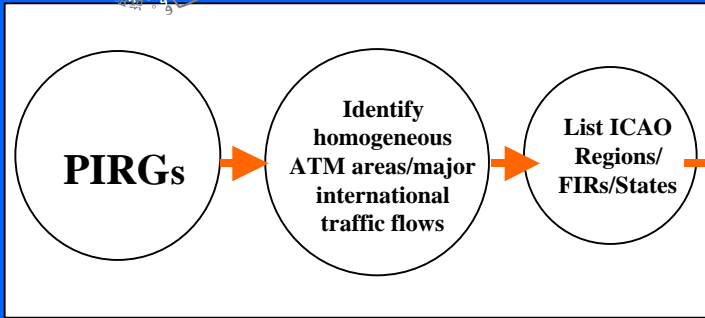


Examples of implementation based on major traffic flow approach

- **Implementation RVSM from Asia to Europe via south of the Himalayas, through the Middle East, effective 23 November 2003; and**
- **RVSM implementation in the Europe/South America corridor, through the Africa-Indian Ocean Region, effective 24 January 2002**



Iterations



Carry out Cost/benefit analysis

Estimate cost of service and determine cost recovery mechanism

Analyse cash flow analysis

Identify financing

Evaluate risk elements

Results in business case for CNS/ATM systems

Scenarios

Development of a business case for the implementation of CNS/ATM systems



Implementation strategy – Principles ...

- A collective commitment of all participating/ concerned entities in the State
- CNS/ATM systems to be introduced in evolutionary stages, with progressive development of technology and procedures
- High-risk approach associated with a “big bang” implementation to be prevented
- Framework must include an integrated approach, encompassing all elements of CNS/ATM, such as technical, operational, economical and institutional issues

(1/2)



Implementation strategy – Principles

- **Current ATM operations not be effected**
- **During the transition and implementation stages, no degradation in the level of safety**
- **Must be a continuous interface with adjacent areas/cross-border States/States within the region to ensure coordinated implementation and consistency of ATM services**

(2/2)



Update on implementation of CNS/ATM systems ...

- **Regional plans for CNS/ATM systems are in different stages of development and maturity**
- **These regional plans for CNS/ATM systems are progressively being incorporated into the FASID of regional plans**

(1/2)



Update on implementation of CNS/ATM systems

- **New format of Regional Air Navigation Plans in the form of ANP/FASID are under final phase of development for MID and ASIA/PAC Regions. Others Regions completed**
- **Guidance material for the development a business case for the implementation of CNS/ATM systems has been released**

(2/2)

