

Global ATM Operational Concept

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Objective

To present the concept and the steps towards the implementation of the future Air Navigation System.



Presentation Outline

- History and Background
- ATM Community
- Concept components
- Guiding principles
- Expectations / KPA's
- Key Conceptual Changes
- Information Management
- Expected benefits
- Summary



History and Background

- FANS
- Tenth Air Navigation Conference
- CNS/ATM Systems
- Global Coordinated Plan for Transition to ICAO CNS/ATM Systems
- Planning and Implementation Regional Groups embarked on an extensive effort
- SARPs, PANS, Guidance material
- Global Air Navigation Plan for CNS/ATM Systems (Doc 9750)
- Eleventh Air Navigation Conference
- ICAO's commitment to adopt a business process approach.



Vision statement

To achieve an interoperable global air traffic management system for all users during all phases of flight, that

- meets agreed levels of safety;
- provides for optimum economic operations;
- is environmentally sustainable; and
- meets national security requirements.



Global ATM Operational Concept

- ✈ The global ATM operational concept is a vision that;
 - ✓ describes how an integrated global Air navigation System should operate
 - ✓ describes what is envisaged on the basis of services
 - ✓ describes how the services form an integrated system
 - ✓ utilizes an information rich environment, that solves most problems strategically, through a collaborative process
 - ✓ provides States and industry with clearer objectives for the design and implementation of ATM and supporting CNS systems



Transition to a Performance Based Air Navigation System

- Technology is not an end in itself
- Requires a comprehensive concept for an integrated, global air navigation system, based on clearly-established operational requirements
- Concept endorsed by the 11th Air Navigation Conference
- Strategic Guidance Established
 - ATM system requirements
 - Transition strategy
 - Performance framework
- **Next steps**
 - Global Performance Objectives to achieve measurable progress towards achievement of the vision of the concept



Performance Objectives

■ Global Performance Objective:

Improvements to the Air Navigation System that are on the critical path towards the Global Operational Concept.

■ Regional Performance Objective:

Considers operating environments and priorities specific to a regional level.



ATM Community

The aggregate of organizations, agencies or entities that may participate, collaborate and cooperate in the planning, development, use, regulation, operation and maintenance of the air navigation system.

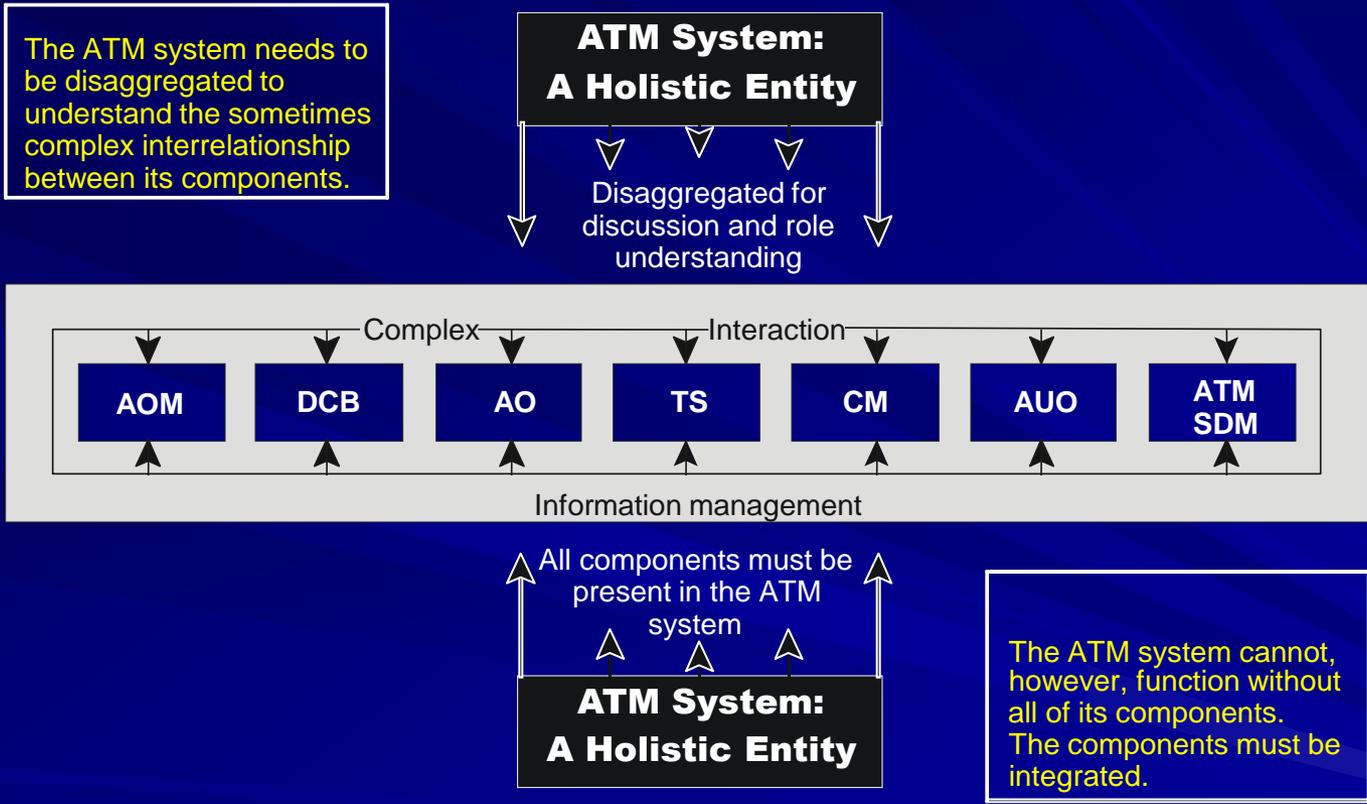


Members of the ATM Community

- Aerodrome community
- Airspace providers
- Airspace users
- ATM service providers
- ATM support industry
- ICAO
- Regulatory authorities
- States



The seven ATM concept components



AOM — Airspace organization and management
DCB — Demand/capacity balancing
AO — Aerodrome operations
TS — Traffic synchronization

CM — Conflict management
AUO — Airspace user operations
ATM SDM — ATM service delivery management



Seven Concept Components

- Airspace organization and management (AOM)
- Aerodrome operations (AO)
- Demand and capacity balancing (DCB)
- Traffic synchronization (TS)
- Airspace user operations (AUO)
- Conflict management (CM)
- ATM service delivery management (SDM)



Guiding Principles in six main areas:

- Safety
- Humans
- Technology
- Information
- Collaboration
- Continuity



Eleven Expectations / KPA's (in alphabetical order)

- Access and Equity
- Capacity
- Cost-effectiveness
- Efficiency
- Environment
- Flexibility
- Global interoperability
- Participation by the ATM community
- Predictability
- Safety
- Security



Key Conceptual Changes

Three Conflict Management Layers

- Strategic conflict management
- Separation provision
- Collision avoidance



Key Conceptual Change

Strategic Conflict Management

- Achieved through airspace organization and management, demand and capacity balancing and traffic synchronization
- “Strategic” is used here to mean “in advance of tactical”
- Strategic conflict management measures aim to reduce the need to apply the second layer — separation provision



Key Conceptual Change

Separation Provision

- The tactical process of keeping aircraft away from hazards by at least the appropriate separation minima
- Only used when strategic conflict management (i.e. airspace organization and management, demand and capacity balancing and traffic synchronization) cannot be used efficiently
- The separator is the agent responsible for separation provision for a conflict and can be either the airspace user or a separation provision service provider.



Key Conceptual Change

Collision avoidance

- The third layer of conflict management
- Must activate when the separation mode has been compromised
- Collision avoidance is not part of separation provision
- Collision avoidance systems are not included in determining the calculated level of safety required for separation provision
- Collision avoidance systems will, however, be considered as part of ATM safety management.



Aeronautical Information Management (AIM)

- **AIM will ensure the cohesion and linkage between the seven concept components**
 - Provides quality-assured and timely information to support ATM operations
 - An information-rich environment will be key to the concept.



Meteorological information

- **Will be tailored to meet ATM requirements in terms of content, format and timeliness**

- **The main benefits of meteorological information, for the ATM system, will be related to the following:**
 1. **to optimize real time flight trajectory planning and prediction, thus improving the safety and efficiency of the ATM system;**

 2. **increased availability of meteorological information (air-reports) from on-board meteorological sensors will contribute to improving forecast meteorological information and the display of real-time information; and**

 3. **meteorological information will contribute to minimizing the aviation impact on environment.**



Other essential services

- **ATM system will provide information to, or may receive information from other essential activities as:**
 - ***Air defence systems and military control systems*** will need timely and accurate information on flights and ATM system intents. They will be involved in airspace reservations and notification of air activities and in enforcing measures related to security.
 - ***Search and rescue organizations*** will need timely and accurate search and rescue information on aircraft in distress and accidents because such information plays an important role in the quality of the search function.
 - ***Aviation accident/incident investigation authorities*** will need to exploit recordings of flight trajectory data and ATM actions.
 - ***Law enforcement (including customs and police authorities)*** will need flight identification and flight trajectory data, as well as information about traffic at aerodromes.
 - ***Regulatory authorities*** will need to implement the regulatory framework within the legal powers given to them and to monitor the safety status of the ATM system.



Expected Benefits in General

- Improved safety management processes will ensure that safety performance remains the highest priority
- Business cases will ensure efficient and cost-effective air navigation system developments and operations
- Collaborative decision making and system-wide ATM information will enable airspace user participation in balancing the demands on the air navigation system, thereby providing flexibility and predictability



Expected Benefits Specifically

- All airspace will be available as a usable resource, resulting in improved access, increased opportunity for user-preferred trajectories and, through community cooperation, increased capacity



Expected Benefits Specifically

- Improved surface management of the aerodrome will provide predictable departure and gate-arrival times, thereby improving overall air navigation system predictability and subsequent capacity



Expected Benefits Specifically

- Improved information exchange and cooperation within the ATM community will maximize system capacity
- Improved all-weather operations will maintain maximum capacity
- Improved information concerning demand and system capabilities will prevent system overloads, ensuring manageable workloads



Expected Benefits Specifically

- Provision of accredited, quality-assured and timely information will allow an informed decision-making process
- The ATM community will contribute to the protection of the environment by taking into consideration the consequences of airspace activities



Summary

- CNS/ATM systems was a first step
- We needed a vision: the operational concept
- Concept consists of 7 integrated components
- The future system will be an information rich environment, that solves most problems strategically, through a collaborative process
- Ongoing work consists of developing
 - Flight and Flow Information for a Collaborative Environment (FF-ICE)
 - Detailed concept components for SARPS development
- **Global Performance Objectives will achieve measurable progress towards achievement of the vision of the Global ATM Operational Concept**

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