CANSO
Latin America & Caribbean Conference
Transforming ATM Performance
24-26 September 2012
Buenos Aires, Argentina
You and ASBU

4th CANSO Latin American and Caribbean Conference
Buenos Aires, 24 -26 September 2012

Javier A. Vanegas
Director Latin America and Caribbean Affairs
The global voice of ATM

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CANSO-ICAO Partnership

**ADVISOR**
CANSO advises ICAO on matters of critical import to all ANSPs, to ANSPs as a group

**FORUM**
CANSO acts as a global forum for ANSP Best Practices, and will help globalize ASBUs

**AUTHOR**
CANSO is authoring several modules, and is supporting the development of others
ICAO has recognised that:

- **Global framework is needed to ensure:**
  - Safety is maintained and enhanced
  - ATM improvement programmes are harmonized
  - Barriers to efficiency are removed

- **Investment certainty is required for:**
  - Operators
  - Infrastructure providers
  - Equipment manufactures

- **Regulatory processes must be streamlined:**
  - To support the introduction of significant changes
The reality of our system today
What is a Block Upgrade?

- Measurable Operational Improvement
- Air & Ground Equipment / Systems
- Operational approval / certification
- Air & Ground Standards / Procedures
- Positive Business Case
We Can Benefit From What Is Already Out There...
A Block is Made Up of Modules...
...and a Block is Scalable to Meet Regional or Local Needs
Four ASBUs

Block 0
Available now

Block 1
2018

Block 2
2023

Block 3
2028>
Modules are Grouped in Four Performance Improvement Areas
Greener Airports
Global Interoperable Systems and Data
Optimum Capacity and Flexible Flights
Efficient Flight Path
## Current Number of Modules within Performance Areas

<table>
<thead>
<tr>
<th>Performance Area</th>
<th>Block 0</th>
<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
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<tr>
<td>Greener Airports</td>
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<tr>
<td>Efficient Flight Path</td>
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Understanding the Relationships

<table>
<thead>
<tr>
<th>Performance Improvement Areas</th>
<th>Block 0 (2013)</th>
<th>Block 1 (2018)</th>
<th>Block 2 (2023)</th>
<th>Block 3 (2028 &amp; &gt;)</th>
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Modules: Threads
Threads Between Modules... and Across Blocks

Greener Airports

Block 0: Improved Traffic Flow through Runway Metering
Block 1: Improved Approach & Departure Management through Integration
Block 2: Linked AMAN/DMAN
Block 3: Integrated AMAN/DMAN/SMAN

Available Now 2018 2023 2028>
Global Interoperable Systems & Data
Through Global SWIM

Block 0
Increased Interoperability, Efficiency & Capacity through Ground-Ground Integration

Available Now

Block 1
Increased Interoperability, Efficiency & Capacity through FF-ICE/1 application before Departure

2018

Block 2
Improved Coordination through multi-centre Ground-Ground integration: (FF-ICE/1 & Flight Object, SWIM)

2023

Block 3
Improved Operational Performance through the introduction of Full FF-ICE

2028+

Threads Between Modules... and Across Blocks
Threads Between Modules... and Across Blocks

Optimum Capacity & Flexible Flights
Through Global Collaborative ATM

Block 0
Improved Flow Performance through Planning Based on a Network-Wide View
Available Now

Block 1
Enhanced Flow Performance through Network Operational Planning
2018

Block 2
Increased User Involvement in the Dynamic Utilisation of the Network
2023

Block 3
Traffic Complexity Management
2028>

canso
TRANSFORMING GLOBAL ATM PERFORMANCE
Efficient Flight Plan
Through Trajectory-based Operations

Block 0
Improved Flexibility & Efficiency in Descent Profiles (CDOs)

Block 1
Improved Flexibility & Efficiency in Descent Profiles (OPDs)

Block 2
Optimised Arrivals in Dense Airspace

Block 3
Full 4D Trajectory based Operations

Available Now 2018 2023 2028+
A Look at Block 0

Performance Improvement Areas

Block 0 (2013)

- Greener Airports
- Globally Interoperable Systems and Data
- Optimum Capacity and Flexible Flights
- Efficient Flight Path
Block 0 Implementation - The Time is Now

- The Modules of Block 0 are ready for implementation today
  - Standards are ready
  - The Infrastructure is available
  - Avionics are ready
  - Ground Automation is ready
  - Procedures and Operational Approvals are in place

- Establishing the foundation for the future is now

- Care was taken to ensure that regional implementation of the Blocks or the Modules are well described and ready for implementation
Each Module is evaluated for its readiness

If any component is not found to be ready it moves to a future Block for implementation

Those Modules that are not specifically ready at a Block release are noted as “dates of readiness”

### Global Readiness Checklist

<table>
<thead>
<tr>
<th>Global Readiness Checklist</th>
<th>Status (ready or date)</th>
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<tr>
<td>Standards Readiness</td>
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<td>Avionics Availability</td>
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<td>Infrastructure Availability</td>
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<tr>
<td>Ground Automation Availability</td>
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<tr>
<td>Procedures Available</td>
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<tr>
<td>Operations Approvals</td>
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</tbody>
</table>
The global voice of ATM

Approval Plan

Procedures

Technology

Transition Strategy

Business case

Regulatory approvals

Operational Trial

Performance improvements

2013

2014

2015

2016

2017

Greener Airports

- Remote TWR
- A-SMGCS
- A-CDM
- Wake Vortex

Global Introp Systems & Data

- FF-ICE 1
- SWIM
- Digital ATM products

Optimum Capacity & Flex Flights

- In-trail ADS-B
- Dynamic ATS Routing
- CDM+Flt.Planning
- Interval Management

Efficient Flight Path

- OPDs
- Initial 4DT
- RPAs

The global voice of ATM
Harmonized ATM- Towards a truly seamless global system

- Align firmly with Block concept- Operators & OEMs
  - Synchronized investments in avionics (Roadmaps)
  - Removes need for regulatory mandates
  - Reduces lead time (6 years away)
  - Reduces costs
  - Minimizes Retrofits (aircraft downtime)
  - Integrated Avionics and quicker installation & Certification

- Synchronized investments by ANSPs / States
  - Block design recognizes regional differences
    - Reduces complexity of competing safety priorities
    - Integrates Needs of domestic & international operations
    - Recognizes Budgets
    - Threads the “modules”
Challenges - How to Get There?

- Budget considerations are greater for Block 1 since these modules do involve technology insertion in either ground/air or both.

- Block 1 has a strong dependency on moving to network based communications for aviation.

- There are regional synchronization issues of equipage and capabilities to achieve much of Block 1. This is essential to the successful implementation to the future Blocks.

- Global standards can alleviate such risks and ensure interoperability between regional ANSPs. Global standards also offer stakeholders a common rubric.
CANSO update

- Feedback to CANSO helped immensely:
  - A better understanding of ANSP requirements and challenges
  - Feedback to the Tech Team for ASBU revisions
  - Inputs to Roadmaps

- CANSO now serves as a “global voice”; the transition to a “Global Partner” needs to take stage now
  - States and ANSPs to ‘socialize’ ASBUs
  - Global Best-Practices, in the spirit of “Partnership for Progress”
The CANSO Position

Need for STANDARDS NOT MANDATES

Need for Global Interoperability very clear:
- Avionics-Ground system: very long lead time
- Ground-Ground stakeholders: more connectivity desired, supported

Diverse regional requirements need greater recognition:
- Seamless operations require synchronized investment across multiple FIRs
- Many States have particular needs, priorities, and approaches not always shared by others
The CANSO Position - focus

- NOT A MANDATE

- Unification of Global Initiatives
  - Focus of NextGen, SESAR, CARATS, FIANS, CNAS, et al
  - Concentrated, focused, modular, complete

- Harmonization of Timeframes and Capability
  - Globally between regions and larger actors
  - Regionally between neighbors
  - Domestically between States and ATC stakeholders

- Business Case
  - Justification for internal action
  - Cross-organizational stakeholder buy-in
  - Supports Cost-Benefit Analyses
thoughts... feedback message to ANSPs

- Cross-reference ATM plans with ASBUs
- Focus on Operational Improvements and less on Technology
- Start talking to the Regulator NOW!
- Consult with GA, Military, stakeholders (don’t forget DOM)
- Look at Training requirements: involve controllers early!
- Work to Regional Agreements
- Metrics and CBAs are ‘key’ to success; including:
  - Investments
  - Minimize mixed equipage
- Address your Safety Net requirements; for example:
  - Hazard Identification and Risk Assessment (HIRA)
  - Airspace re-design
Challenges to Global Harmonization

- It is critical that future ATM technologies be compatible and interoperable (Standards).
- Integration of new technologies, systems, procedures and concepts into domestic airspace (mixing new with old).
- Regional collaboration to coordinate modernization technologies and time lines (cross boundary and multilateral harmonization).
- Service Provider and Operator investment required to realize full benefits (infrastructure, avionics, procedures).
- ICAO, CANSO and others must continue leadership role in promoting cross-regional harmonization (ICAO Block Upgrades).
Milestones

- CANSO Working Papers
  - Format
  - Actions
  - Support

- ICAO WPs
- Roadmaps (7)
- ASBU development
- Policy (GANP)
Timelines

- Monthly Telcons
- Response to State Letter: done
- End March – review of WPs
- March 2012- GANP
- End April- WP Review by PSC
- End May- Possible collaboration for joint WP (ACI, ECTL, IATA)
- End June – Preview at AGM
- End July – Finalization
- September – PBN Workshop
- October – Cl V M I L
- November 16-30??
Muchas gracias

PARTNERSHIP

"You give me half the fish, and I'll tell my mom to let you live."
You and ASBU

Ludmilla Gonzalez

Thales
ICAO ASBUs Block 0 and Block 1 – Industry Capabilities and experiences
Block 0: Deployment Experience; Block 1: planning

CANSO Latin America, Buenos Aires, 26 Septembre 2012

Ludmilla Gonzales
Latin America Business Development Manager, Thales
Aviation System Block Upgrades describe the changes required to the ATM system following 2 dimensions:

- **A functional dimension showing the necessary changes according to operational performance areas**
  - 4 key aviation performance areas were identified:
    1. Greener airport
    2. Globally interoperable systems and data
    3. Optimum Capacity and flexible flights
    4. Efficient flight path
  - Inside each of them modules were identified (equivalent to the SESAR Operational Focus Area (OFA)) that includes what is required to achieve one or several well defined performance objectives described in terms of:
    - Operational need
    - Required CNS upgrade
    - Set of procedures

- **A time dimension**
  - 4 time blocks
    - Block 0 corresponding to availability milestones beginning in 2013
    - Block 1 corresponding to availability milestones beginning in 2018
    - Block 2 corresponding to availability milestones beginning in 2023
    - Block 3 corresponding to availability milestones beginning in 2028
Block 0 (2013) goal is to ensure ANSPs across the globe have access to key safety and efficiency capabilities:

- Maximise use of “what we have”
- Combined with appropriate Best-Practices
- Fix some key safety and efficiency issues and improve the environmental outcomes

Thales ATM solutions:

- Fully enable implementation of Block 0

Demonstrated through the current implementation of some Block 0 modules
1- Making Airports Greener and More Efficient

**B0-15: Improved Traffic Flow through Runway Metering**

- AMAN (& DMAN) operational in different operating environments: Charles de Gaulle, Sydney, Johannesburg, Copenhagen, TMA (US)...
- Benefits: capacity, efficiency and positive environmental impact

**B0-75: Improved Runway Safety**

- A-SMGCS operational in Abu Dhabi, Bangkok.....
- Improved situational awareness and runway incursion alerts
- Benefits: safety and capacity in all weather conditions
2 - Ensuring the Global Interoperability of Systems and Data

**B0-25 Increased performance through Ground-Ground Integration**

- ATS Inter-facility Data Communication (AIDC) operational: Asia-Pacific, Africa and Latin America
- On-Line Data Interchange (OLDI) operational: Europe
- Benefits: capacity, efficiency, interoperability and safety

**B0-30: Service Improvement through Digital Aeronautical Information Management**

- Global standard AIXM
- Systems operational in France, Taiwan...
- European coordinated provision of AIM (EAD)
- Benefits: cost effectiveness and safety
3 - Achieving Optimum Capacity and Flexible Flights

**B0-10 Improved Operations Through Enhanced En-route Trajectories**

- Ground automation supporting Flexible Use of Airspace and Flex Tracks; integrating data from FANS equipped aircraft...
- Benefits: flight efficiency, flexibility and positive environmental impact
- Flex Tracks and User Preferred Routing operational in South Pacific and Indian Ocean...

**B0-35 Improved Air Traffic Flow Management**

- Solutions operational: Europe (CFMU), US (Command Centre) and South Africa (CAMU)
- Benefits: capacity, efficiency, flexibility and airspace accessibility
- Different operational concepts depending on the specific operating environment
B0-05 & B0-20: Improved Performance in Descent and Departure Profiles

- Advanced aircraft capabilities available but currently underutilised
- Ground systems are available that support procedures using RNP, RNAV, CDO and CCO
- Mainly an airspace/route structure and procedures design issue for Block 0
- Existing IATA/CANSO activities on PBN go teams
- Benefits: flight efficiency and positive environmental impact
B0-40 Improved Performance through the Application of Data-Link en Route

- Ground systems supporting CPDLC and ADS-C for FANS-1/A+ and Link2000+
- Operational many places globally mainly in Oceanic and transcontinental airspace. Initial operations in high surveillance airspace in Maastricht
- Benefits vary with the environment: capacity, efficiency and safety...
Bringing Experience to Block 0

- Capabilities for Block 0 already available in both the air and ground systems

- Commitment to the use of existing standards, currently underutilised
  - Though some standards could have been simplified

- Procedure and airspace design are needed to facilitate some of the Block 0 implementations

- The need for education, sharing the experience of early implementers

There is no technical excuse to do nothing
Blocks 1 (2018) and later blocks (starting 2023) aim to make advanced capabilities of NextGen and SESAR available to the broader ANSP community

Thales ATM solutions:

- Enable implementation of elements of Block 1.
- Roadmap aligned with ASBU; timing depends on validation status of NextGen/SESAR
- Anticipated benefits are being assessed as part as of R&D work

Demonstrated through active involvement in initiatives related to some Block 1 modules
B1-70: Increased runway throughput through dynamic Wake turbulence separation

- Improved throughput on departure and arrival runways through the dynamic management of wake-vortex separation minima based on the real time identification of wake-vortex hazards
- SESAR p12.02.02 (Runway Management)

B1-75: Enhance Safety & Efficiency of Surface Operations (ATSA-SURF)

- Airport surface surveillance for ANSP and flight crews with safety logic, cockpit moving map displays and visual systems for taxi operations
- SESAR p12.03.01 (Improved Surveillance for Surface Management) & 12.03.02 (Enhanced Surface Safety Nets)
B1-15: Improved airport operations through Departure, Surface & Arrival Management

- Extended arrival metering, integration of surface management with departure sequencing bring robustness to runways management and increase airport performances and flight efficiency
- SESAR p12.04.04 (Integration of Departure Management and Surface Management)

B1-80: Optimised airport operations through airport CDM

- Airport operational improvements through the way operational partners at airport work together
- SESAR p12.06.08 (Introduction of the UDPP and collaborative departure sequence)
B1-25: Increased interoperability, efficiency and capacity through FF-ICE/1 application before departure

- Introduction of FF-ICE step 1, to implement ground-ground exchanges using common flight information reference model FIXM/XML and the Flight Object used before departure
- SESAR p10.02.05 (Flight Object IOP System Requirement & Validation)

B1-31: Performance improvement through the application of SWIM

- Implementation of SWIM services (applications and infrastructure) creating the Aviation intranet based on standard data models, and internet-based protocols to maximise interoperability
- SESAR p14.02.09 (SWIM Platform development and demonstrator delivery)
B1-30: Service Improvement through integration of all Digital ATM information

- Implementation of the ATM information reference model integrating all ATM information using UML and enabling XML data representations and data exchange based on internet protocols with WXXM for meteorological information
- SESAR p13.02.02 (Aeronautical Information Management sub-system definition)
B1-10: Improved operations through free routing.

- Introduction of free routing in defined airspace, where the flight plan is not defined as segments of a published route network or track system to facilitate adherence to the user-preferred profile
- Current work: already supported by current systems (direct routings, Flex tracks UPRs)

B1-105: Better operational decisions through integrated weather information (Strategic > 40 mins).

- Weather information supporting automated decision process or aids involving: weather information, weather translation, ATM impact conversion and ATM decision support
- Current work: SESAR WP11
**B1-05: Improved flexibility and efficiency in descent profiles (OPDs)**

- Deployment of performance-based aircraft and arrival procedures that allow the aircraft to fly their Optimised Profile Descents taking account of airspace & traffic complexity
- Current work: initial support by current systems, additional work in SESAR/NextGen

**B1-40: Improved traffic synchronisation and initial TBO**

- Use of 4DTRAD capability & airport apps in trajectory-based operations to improve traffic flows synchronisation at en-route merging points and to optimize the approach sequence through air ground exchanges & specifically a single control time of arrival
- Additional benefits: enable the mechanisms for air-ground trajectory exchange irrespective of the I-4D concept validation
- Current work: SESAR Initial-4D
Aircraft capabilities for I-4D will progressively be available from 2018:

Ground capabilities for I-4D can be delivered in a consistent timeframe

Improved weather models are being developed but advanced concepts and common weather picture will not be available to the FMS until after 2025

NextGen and SESAR have different SWIM drivers: other ANSPs or regions need to consider the applicability of each model:

Additional TBO capabilities available in SESAR Step 2 but current NextGen plans are beyond 2025 for most capabilities

Key dependencies on SESAR & NextGen could influence final Block 1 implementation
Closing remarks
See you next year!

CANSO Latin & America & Caribbean Conference 2013

14 June 2013, Willemstad, Curacao

Kindly hosted by DC-ANSP