



International Civil Aviation Organization

Thales implementation of AIS to AIM migration steps in its TopSky-AIM product line – Focus on selected technologies

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Presentation agenda

- Part A : Presentation of Thales AIM team, TopSky-AIM product line and TopSky-AIM references
- Part B : Implementation of AIS to AIM transition steps in TopSky-AIM product line – Focus on technologies implemented



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Part A : Presentation of Thales AIM team and TopSky-AIM product line



TopSky-AIM Introduction

- A dedicated Team of 50 persons
 - Involved in Aeronautical Information Management (AIM)
 - And AFTN / AMHS switch
- Located in Paris, Part of ATM activity
- Strongest and longest experience in AIM
 - Thales is involved in AIS/AIM for more than 20 years
 - Thales has references in all data format standards (ARINC to AIXM 5.1)
- Part of TopSky-ATM suite

TopSky
AIM

TopSky – AIXM

TopSky – eAIP

TopSky – DNotam

AIP-GIS® Charting

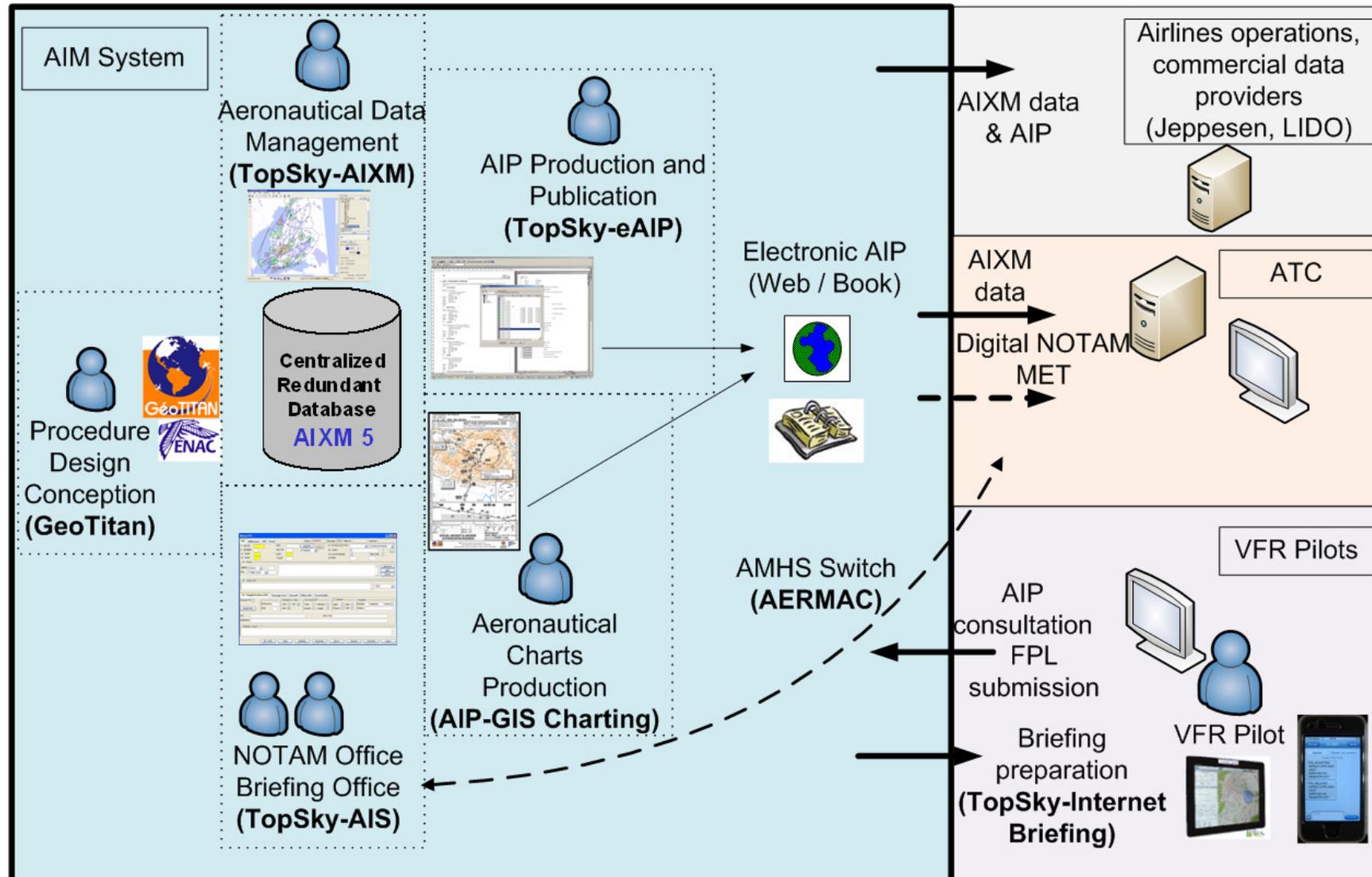
GeoTITAN®

TopSky – AIS

TopSky – Internet Briefing

FlyBrief™

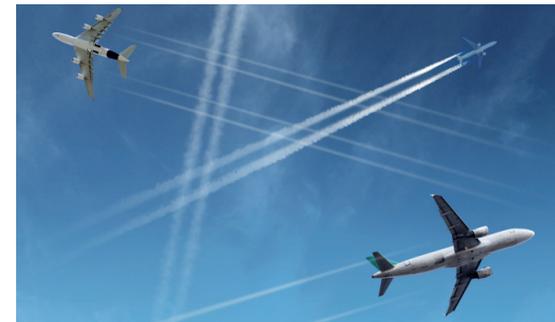
TopSky-AIM System overview





Thales AIM participation in SESAR

- Thales : the reference industrial member with the largest investment level (40% of the ground industry & 22% of the airborne industry)
- TopSky-AIM product roadmap fully aligned to SESAR developments
- Active participation in SESAR:
 - Project 8.1.4: Enhancements of AIXM5 model
 - Project 8.3.3: Definition of external interfaces of AIM systems
 - Project 13.2.2: Implementation of future AIM systems (incl. Digital NOTAM proto)
 - Project 14.2.9: SWIM platform development



250 Thales experts from France, Italy, Australia, Germany, Spain and USA are delivering SESAR technologies



TopSky-AIM compliance with ASBU



B0-30

Service Improvement through Digital Aeronautical Information Management

- Implementation of the AIM Transition from AIS to AIM detailed in 21 steps.
- Solution compliant with AIXM 5 and Digital NOTAM

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 - AIM sub-system definition)

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

Demonstrated through references for Block 0 and R&D projects for Block 1

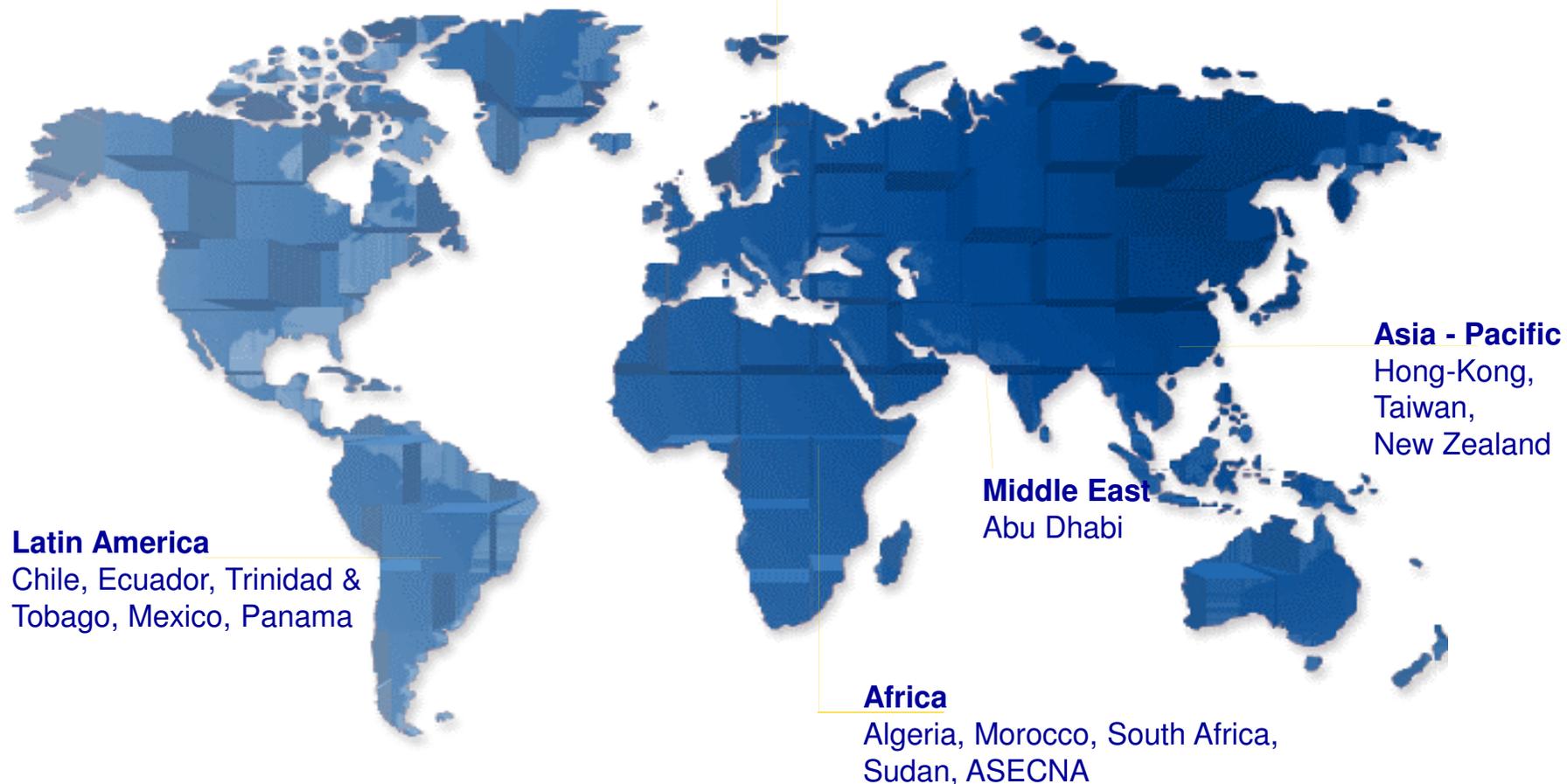


TopSky-AIM references

Europe

Austria, Germany, Croatia,
Estonia, Netherlands, Finland,
France

Thales AIM : 21 References in the World





ASECNA AIM system presentation

- Description:
 - Full AIM solution composed of AIXM / eAIP / Charting / AIS components
- Specificities:
 - Distributed Architecture on multiple sites
 - Servers in Dakar and Paris
 - Real time replication mechanisms
 - AIS Terminals installed in 17 countries
 - Integration of AIM system with existing Geotitan application
 - AIP of 17 countries
 - AIP Display on web server
 - High volume AIP / Charts
 - Compliant with New FPL 2012 format
- Schedule
 - Awarded in December 2010
 - FAT successful in September 2011
 - SAT successful in July 2012
 - Operational migration in progress

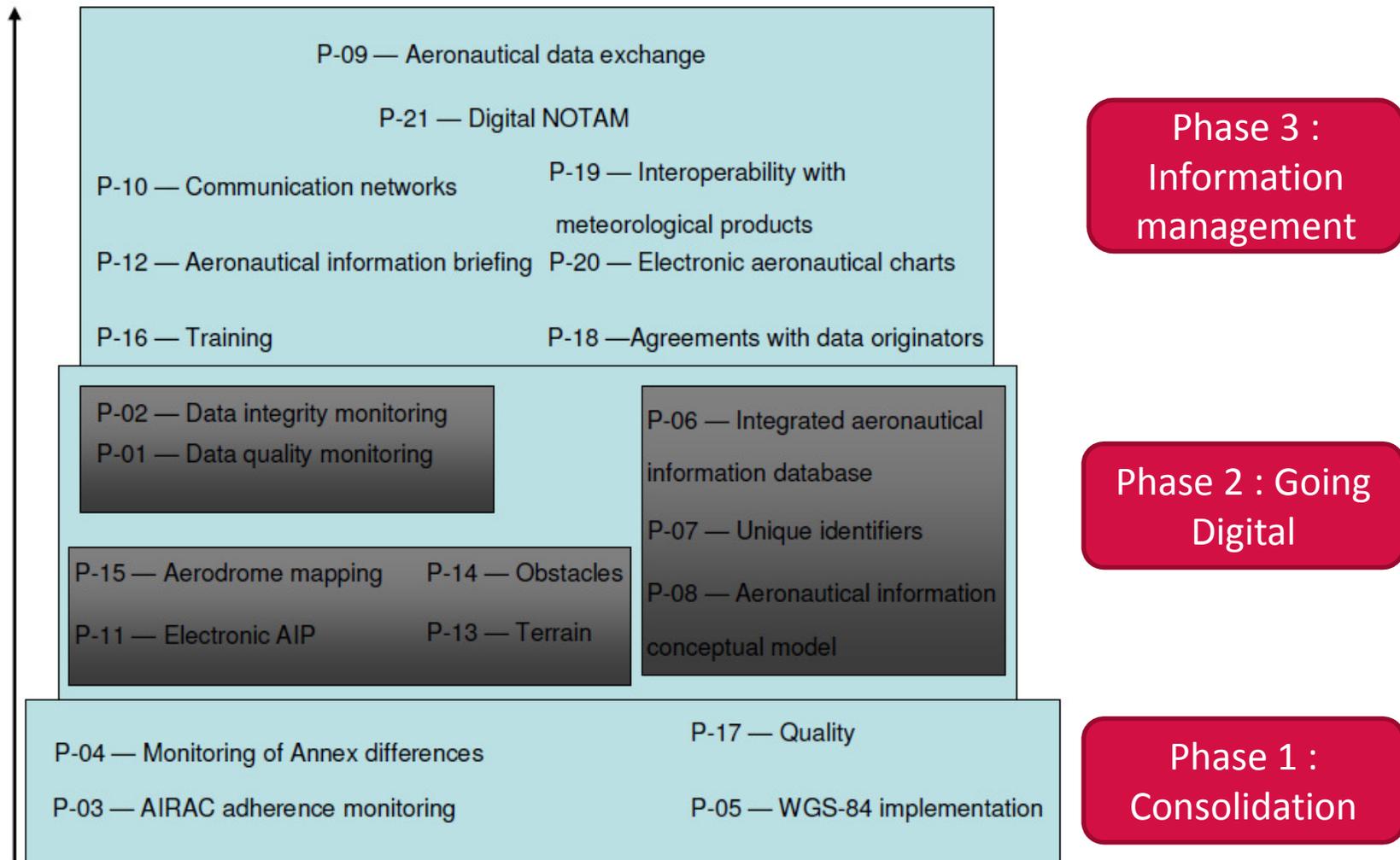


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Part B : Implementation of AIS to AIM transition steps in TopSky-AIM product line – Focus on technologies implemented



Reminder of AIS to AIM transition steps



Implementation of phase 1 (Consolidation) in TopSky-AIM product line



Step	Step objective	TopSky-AIXM status	Means of compliance
P-03	AIRAC adherence monitoring	Compliant	AIRAC dates highlight in all TopSky-AIM components
P-04	P-04 — Monitoring of Annex differences	Compliant	TopSky-AIM product policy (ICAO Annex changes follow up)
P-05	WGS-84 implementation	Compliant	TopSky-AIXM input forms TopSky-AIXM Business Rules Engine
P-17	Quality	Compliant	Thales development , safety and security processes

Implementation of phase 2 (Going Digital) in TopSky-AIM product line (1/2)



Step	Step objective	TopSky-AIM status	Means of compliance
P-01	Data quality monitoring	Compliant	ADQ regulation implementation TopSky-AIM Business rules engine on input and output products
P-02	Data integrity monitoring	Compliant	ADQ regulation implementation Thales development process SWAL level
P-11	Electronic AIP	Compliant	TopSky-eAIP component
P-13	Terrain	Compliant	Storage
P-14	Obstacles	Compliant	TopSky-AIXM obstacles input forms Data transformation layer for CSV to AIXM5.1 conversion
P-15	Aerodrome mapping	Compliant	Storage TopSky-AIM Data transformation layer for conversion

Implementation of phase 2 (Going Digital) in TopSky-AIM product line (2/2)



Step	Step objective	TopSky-AIM status	Means of compliance
P-06	Integrated aeronautical information database	Compliant	TopSky-AIXM AIXM5.1 database used by all TopSky-AIM components
P-07	Unique identifiers	Compliant	TopSky-AIXM UUID management
P-08	Aeronautical information conceptual model	Compliant	TopSky-AIXM fully compliance with AIXM 5.1 UML model TopSky-DNOTAM fully compliant with ECTL Digital NOTAM event specifications

Implementation of phase 3 (Information management) in TopSky-AIM product line



Step	Step objective	TopSky-AIM status	Means of compliance
P-09	Aeronautical data exchange	Compliant	TopSky-AIXM AIXM5.1 import/export function, geometry expressed in GML, WFS interface
P-10	Communication networks	Compliant	Full compliance with IP and AMHS networks (TopSky-AMHS)
P-12	Aeronautical information briefing	Compliant	TopSky-AIS and TopSky-Internet Briefing modules
P-16	Training	Compliant	Thales Training center – Dedicated AIM trainings
P-18	Agreements with data originators	Compliant	TopSky-AIXM plan function, TopSky-AIXM import function
P-19	Interoperability with meteorological products	Compliant	TopSky-AIS and TopSky-Internet Briefing modules
P-20	P-20 — Electronic aeronautical charts	Compliant	CGX AERO AIP-GIS® Charting module integrated with TopSky-AIXM database

Technology focus



- TopSky-AIM product line implements latest technologies proposed by Eurocontrol and OGC and selected by SESAR and NEXTGEN programs
 - Full SOA architecture (intense use of web services for communication between components and for communication with external systems)
 - Full web/JEE6 architecture for TopSky-AIM components
 - SWIM interface : WFS implementation for the communication between TopSky-AIXM and external components (TopSky-Dnotam for instance)
 - Business rules engine based on schematron technology as proposed by Eurocontrol – Available as a web service usable by external systems
 - GIS component based on ESRI framework
 - Data transformation layer based on ESRI transformation layer
 - Workflow module based on ESRI workflow engine



Conclusion

- Complete, mature and innovative AIM solution
- Already fully compliant with Phase1/Phase 2 and Phase 3 AIS to AIM transition steps
- Fully SOA solution implementing technologies proposed by Eurocontrol and OGC and selected by SESAR and NextGen research programs

TopSky-AIM the ready to use AIM solution
developped and certified by THALES

Thank you



Thank you for your attention