

e-AIP Developments within TopSky-AIM product

AFI REGION AIXM-EAIP IMPLEMENTATION WORKSHOP
(DAKAR, SENEGAL, 3-5 OCTOBER 2016)

Hervé Puget – TopSky-AIM Product Line Manager



e-AIP Developments within **TopSky-AIM** product

- 1 – AIM IN THE HEART OF THALES
- 2 – A MULTI COUNTRY SOLUTION
- 3 – AIXM5.1 VERSUS AIXM4.5
- 4 – TOPSKY-EAIP SMART & MODERN DESIGN
- 5 – TOPSKY-AIM BENEFITS FOR AFI
- 6 – ASBU ROADMAP, WHATS NEXT ?



1- **Aeronautical Data** (AIM) in the **Heart of THALES**

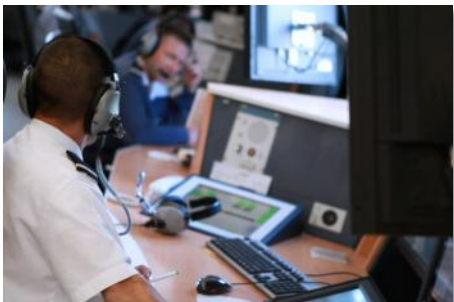
Airport & Air **Traffic**
Management



Flight
Avionics



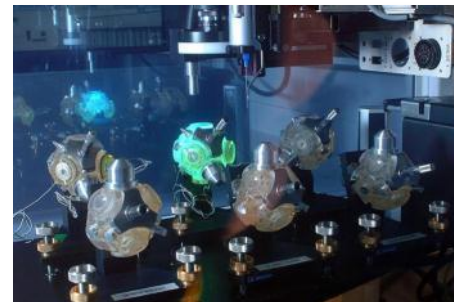
Unmanned Aerial
Vehicles systems



Command & **Control**
Centres - Air Operations



Critical Information
and **Cybersecurity**



Navigation
Solutions

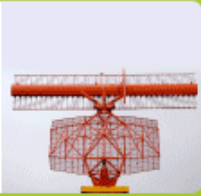
1- AIM part of ATM, THALES ATM solutions are trusted by 180 countries

TopSky

ATM Solutions

Shaping Tomorrow's Sky

Over
680
Radars in
operation



7,000
Nav aids



TopSky

AIM

130

Air Traffic Control
Systems



2 out of every 3 planes

take-off and land safely than
to Thales

Over
3,000

Controller Positions
More than



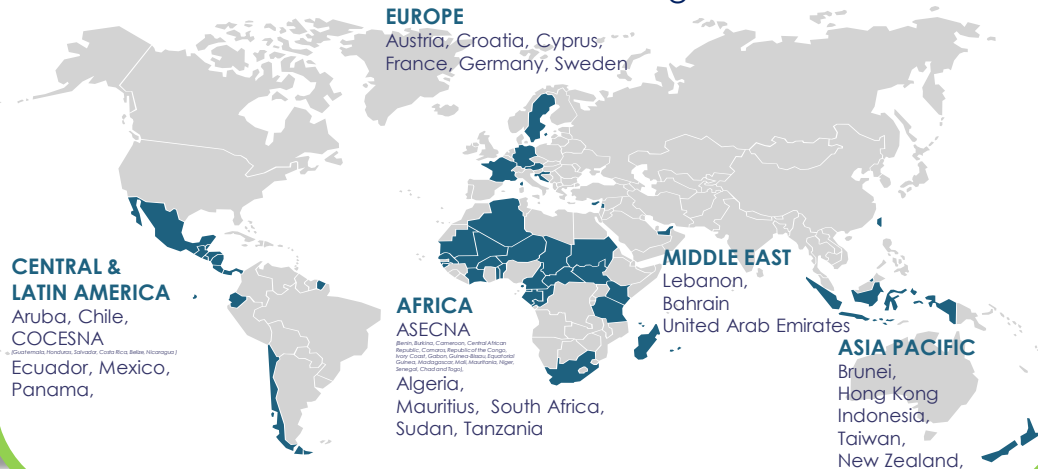
Over
25
Tower
Systems
in
operation



26 Aeronautical
Information
Mgt. Systems

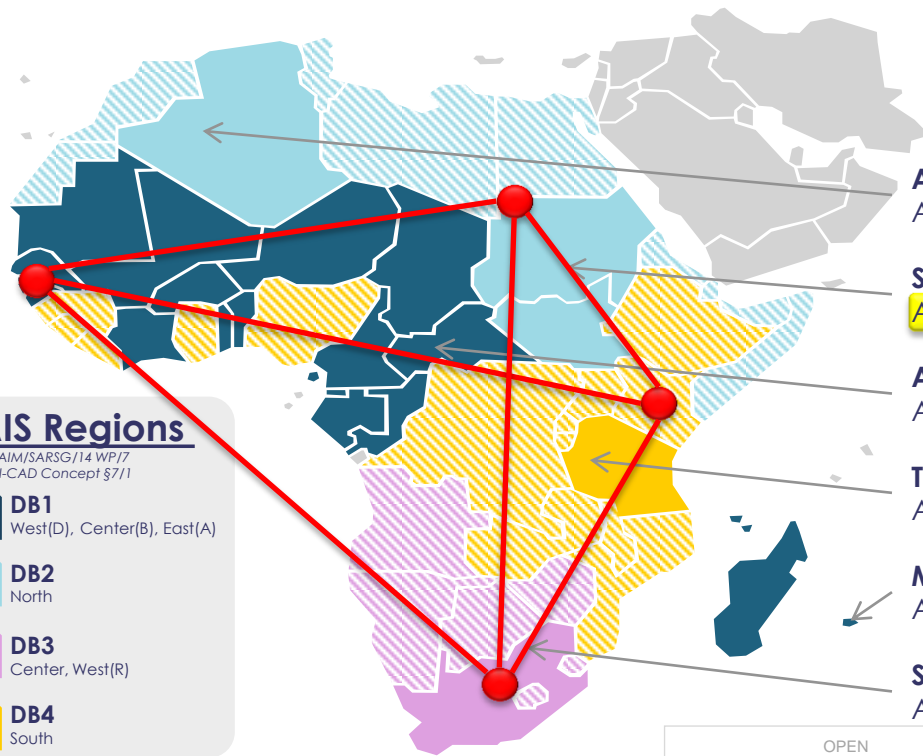
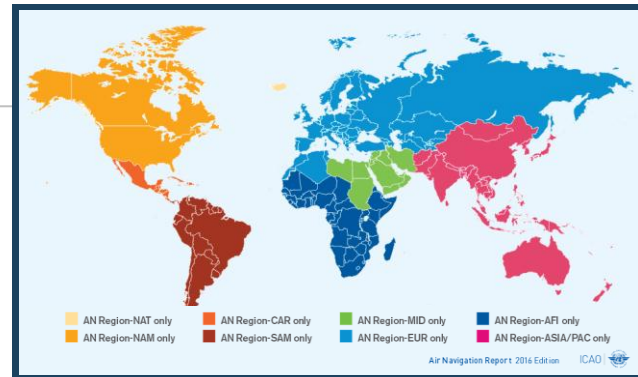
1,800
ADS-B &
Multilateration Equip.

26 AIM References worldwide in **44** countries
including **8** in AIXM5.1



2- TopSky-AIM / a Multi-Country Solution !

Ready for **Large deployment in AFRICA & Multi-Region integrations**



4 AIS Regions

cf. ATM/AIM/SARSG/14 WP/7
 ICAO AFI-CAD Concept §7/1

- DB1**
West(D), Center(B), East(A)
- DB2**
North
- DB3**
Center, West(R)
- DB4**
South

- Algeria**
AIXM3.3 & AIS
- Sudan**
AIXM5.1 & AIS
- ASECNA (x16)**
AIXM4.5 & AIS
- Tanzania**
AIXM4.5 & AIS
- Mauritius**
AIS
- South Africa**
AIS

06/2016 Thales AIXM5.1 system commissioned in Africa !

Operational eAIP being finalized & published very soon.

21 countries operates **Thales AIM/AIS** systems

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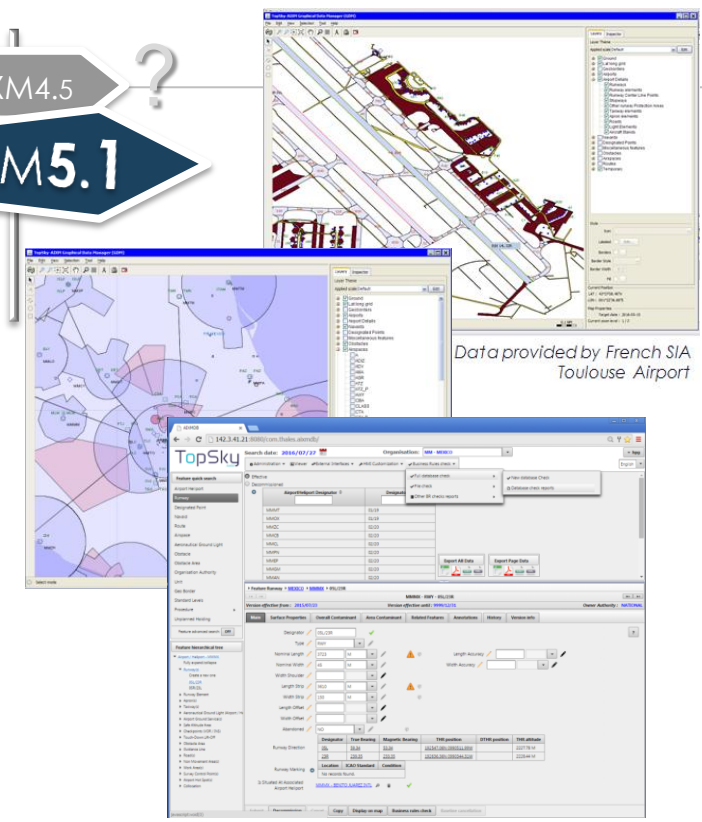
3- Why AIXM 5.1 in AIM ? / versus AIXM 4.5

It is a MUST to achieve ICAO AIS to AIM transition, requiring to :

- be eTOD Obstacle ready
- draw SID/STAR/IAP Procedures Geometry in Chart
- enable AMDB airport mapping production
- enable Business rules quality improvement
- manage the temporality
- enable SWIM for digital data exchange
- be Digital NOTAM ready

AIXM 5.1 remains compatible with AIXM 4.5 :

- when AIXM4.5 is the reference, Thales is able to do a mapping in AIXM5.1, then a validation by ATM SMS and the Regulator of AIXM5.1 converted data will remain mandatory until AIXM5.1 be the reference.

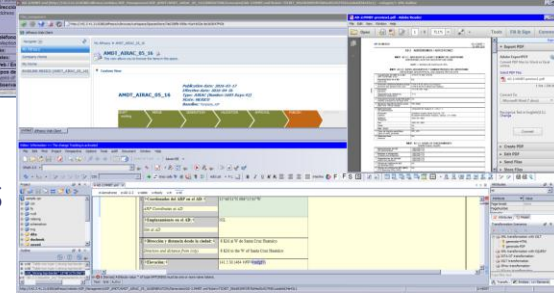
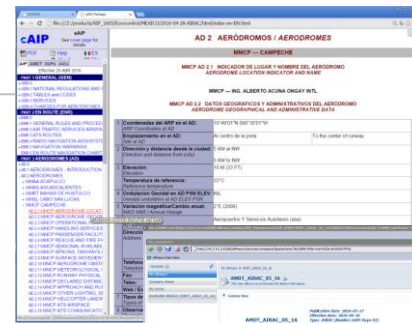


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4- TopSky-eAIP / Smart & Modern DESIGN

Integrated Solution with Open interface

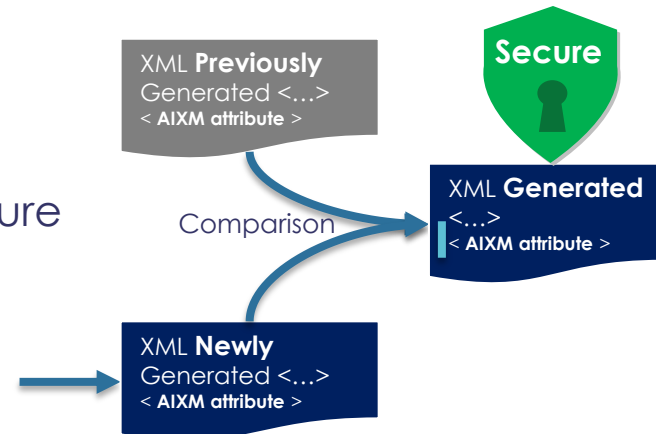
- TopSky-eAIP, AGC Charting and GéoTITAN (Procedure Design including PBN) are fully integrated with TopSky-AIXM (AIXM5 database)
- TopSky-eAIP is able to manage Several output & products (IAC, VAC Aerodromes ...)



Secured Automatic Generation of TopSky-eAIP

- Smart Design allowing Automation, Customization
- Modern design handling XML as internal data structure
- Do not open Doors when data should be protected

- Indeed, AIP changes are identified at the latest stage during comparison between 2 XML files.



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5- TopSky-AIM / Benefits for AFI area

Multi-Country *(within a region)*

- AIS (multi-NOF, multi ARO)
- Internet Briefing (large capacity)
- AIM (multi-AIP)
- Centralized AIXM database
- Remote country access capability for AIS/AIM functions
- Solution for limited bandwidth network
- Contingent AIS/AIM database in remote country



Multi-Region *(between 4 African Regions)*

- Ready to exchange/share AIXM
- Country/Region remain responsible of its own UUID (AIXM5) until guideline from ICAO

Improve AIP Quality & consistency

- TopSky-eAIP generates AIP using data extracted from a centralized AIXM database avoiding errors issued from AIP constructed from several legacy database.



Improve AFI ANSP missing FPL concern

- TopSky-AIS compute and fill-up automatically the AFTN/AMHS distribution address.

issue from ICAO AFI-SNMC/23, 15-19 February 2016

§12 Main causes – Omission of AFTN addresses of certain organism in charge of air traffic control.

Procedure design including PBN fully integrated in AIXM5

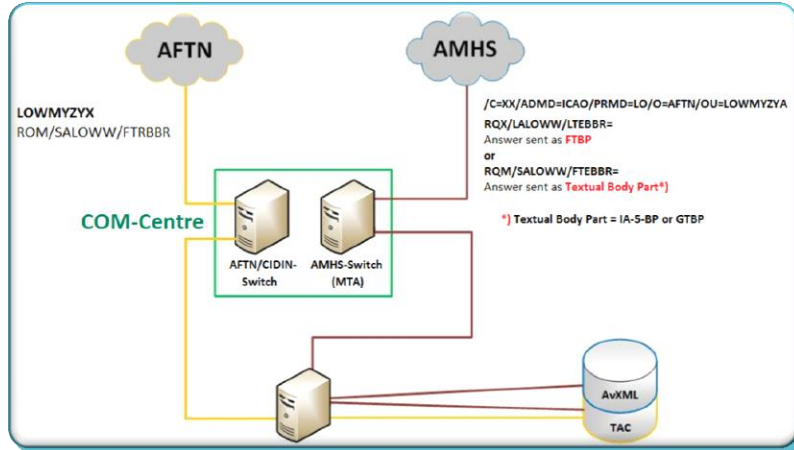
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6- ASBU Roadmap / What's next ?

B1-AMET

Digital Meteo (IWXXM) under AMHS
ICAO Amendment 77 to Annex 3

Effective on	Applicable (should)	Mandatory (Shall)
11 July 2016	10 November 2016	November 2018 (or 2019)

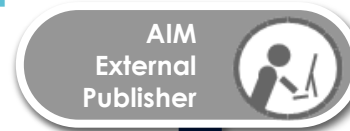


ICAO (EUR Doc 033) First Edition – 2016
Concept of Operations for the Transition of OPMET Data Exchange using IWXXM

B1-DAIM

> Digital NOTAM

B1-SWIM



- AIFS - WFS2.0
- AINS - WS-N 1.3
- AMQP 1.0
- email
- AMHS



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The **TOPLINK** demonstration project, bringing together **14 European partners**, test a panel of new Aeronautical Information Services, in order to **optimize pertinence, accuracy and readability of aeronautical data** during flight, and after specific training for pilots, airlines, ground flight dispatchers and air traffic controllers.



Contribution

Consolidated & extended **AIM data** available via **SWIM** to Airlines Operation Centre and other consumer systems enabling capacity increase

http://www.sesar/...TOPLINK_AIM_GATE.pdf



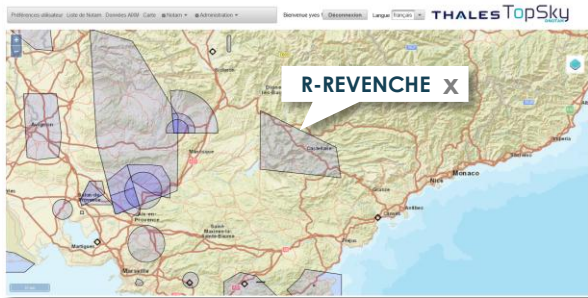
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Creating an AIP SUP from Digital NOTAM



+

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R007016 NOTAMN
Q) LFMQRRCAR/BOW/000195435N00628E/15
A) LFM (E) 160120531 O) 150622130
O) SEP 12 0630-0930 SEP 12 1130-1330 SEP 12 1815-2130 SEP 13
0630-0930 SEP 13 1300-2030 SEP 14 0630-0930 SEP 14 1815-2130 SEP 15
0630-1230 SEP 15 1815-2130 SEP 16 0700-1030 SEP 16 1300-1600 SEP 16
1815-2130 SEP 17 0630-0930 SEP 17 1815-2130 SEP 18 0630-0930 SEP 18
1815-2130 SEP 20 0630-0930 SEP 20 1200-1500 SEP 20 1815-2130 SEP 21
0630-0930 SEP 21 1815-2130 SEP 22 0630-0930 SEP 22 1130-1500 SEP 22
1815-2130
E) RESTRICTED AREA (REVENGE) ESTABLISHED FOR MILITARY EXERCISE AS
FOLLOWS:
440130N 005133E - 435137N 004141E - 434329N 0044328E - 434547N
0061324E - 440130N 006133E
RAMBERT INFO: 143 550 MHz / 317 500 MHz
MARSEILLE INFO: 124 500 MHz / 120 550 MHz
MARSEILLE CTL: 127 900 MHz
NICE INFO: 120 800 MHz
FANNY CTL: 127 975 MHz / 378 675 MHz

AUTHORITIES TO CONTACT
- BEFORE THE EXERCISE:
SHIFT MANAGER OF THE CHARLES DE GAULLE AIRCRAFT CARRIER
PHONE: +33(0)4 84 02 11 80
OPERATIONS MANAGER OF THE EMBARKED AIR GROUP
PHONE: +33(0)2 22 06 96 52 OR +33(0)4 84 02 10
-DURING THE EXERCISE:
CONTROL AND REPORTING CENTRE
(CRC) OF LYON MONTVERDUN
PHONE: +33(0)4 78 14 68 21
SHIFT MANAGER OF THE CHARLES DE GAULLE AIRCRAFT CARRIER
PHONE: +33(0)4 84 02 11 80
OPERATIONS MANAGER OF THE EMBARKED AIR GROUP
PHONE: +33(0)4 84 02 10 83
TEMPORARY RESTRICTED AREA (ZRT) COEXISTING WITH THE CONTROLLED
AIRSPACE AND REPLACING THE RESTRICTED AREAS WITH WHICH IT OVERLAPS
GAT / MIL AIR TRAFFIC
COMPULSORY AVOIDANCE EXCEPT FOR:
- AIRCRAFT INVOLVED IN THE EXERCISE
- AIRCRAFT CONDUCTING ASSISTANCE, RESCUE OR PUBLIC SAFETY MISSIONS
WHEN THE AVOIDANCE IS NOT COMPATIBLE WITH THESE OPERATIONS, AFTER
PRIOR COORDINATION
WITH THE CRC OF LYON MONTVERDUN (OR THE REPLACING CRC IN CASE OF
REPLACEMENT PLAN) AFTER NOTIFICATION WITH 10-MINUTE PRIOR NOTICE
MIL AIR TRAFFIC FLIGHT INFORMATION, ALERTING AND ASSISTANCE ARE
PROVIDED IN THE ZRT BY THE MANAGING AUTHORITY.
GAT: IN THE PORTIONS OF THE ZRT COEXISTING WITH CONTROLLED
AIRSPACES, THE USUAL ATC UNITS PROVIDE, TO USERS CLEARED INTO THE Z
RT, THE ATIS IN ACCORDANCE
WITH THE CLASS OF THESE CONTROLLED AIRSPACES.
F) FL100 (G) FL195
    
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Directeur des Opérations Service de l'Information Aéronautique Phone: +33(0) 5 67 82 87 26 or 87 87 87 Email: info.aip@dgac.fr Internet: www.ifa.dgac.fr/ifa/ifa.aspx		AIP SUP 175/16 Publication date: 18 AUG
Subject : Creation of a Temporary Restricted Area (ZRT) for Exercise "REVENGE 2016" in Marseille FIR LFMM		
Validity : From 12 to 22 September 2016		
		ACTIVITY Exercise involving numerical Defence aircraft such as combat aircraft or French helicopters, day and night, in all flight conditions and at all levels.
DATE AND TIME OF ACTIVITY 12: 0630-0930 11:30-1330 1815-2130 13: 0630-0930 1300-2030 14: 0630-0930 1815-2130 15: 0630-1230 1815-2130 16: 0700-1030 1300-1600 1815-2130 17: 0630-0930 1815-2130 18: 0630-0930 1300-1600 1815-2130 20: 0630-0930 1200-1500 1815-2130 21: 0630-0930 1815-2130 22: 0630-0930 1130-1500 1815-2130		USERS INFORMATION RAMBERT INFO: 143 550 MHz / 317 500 MHz MARSEILLE INFO: 124 500 MHz / 120 550 MHz MARSEILLE CTL: 127 900 MHz NICE INFO: 120 800 MHz FANNY CTL: 127 975 MHz / 378 675 MHz

The associated graphical view

And automatic conversion to ICAO NOTAM

Substitute the creation of an AIP SUP
Simple & Secure !

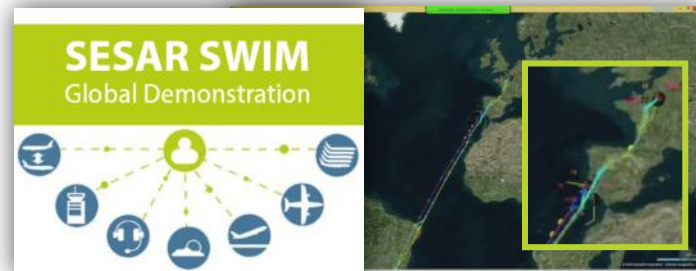


Create the DNOTAM for a Temporary Restricted ZRT



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- Event organized by SESAR with the framework of ICAO and the FAA.
- 40 organizations demonstrating SWIM global interoperability capabilities in accordance with regional plans as well as ICAO provisions.
 - Simulate several kinds of information exchange related to different phases of the flight, such as: flight planning, departure, cruise and arrival.
 - During each phase, events demonstrates information publication in standard SWIM formats: AIXM for aeronautical information, iWXXM for meteorological information and FIXM for flight and network information.



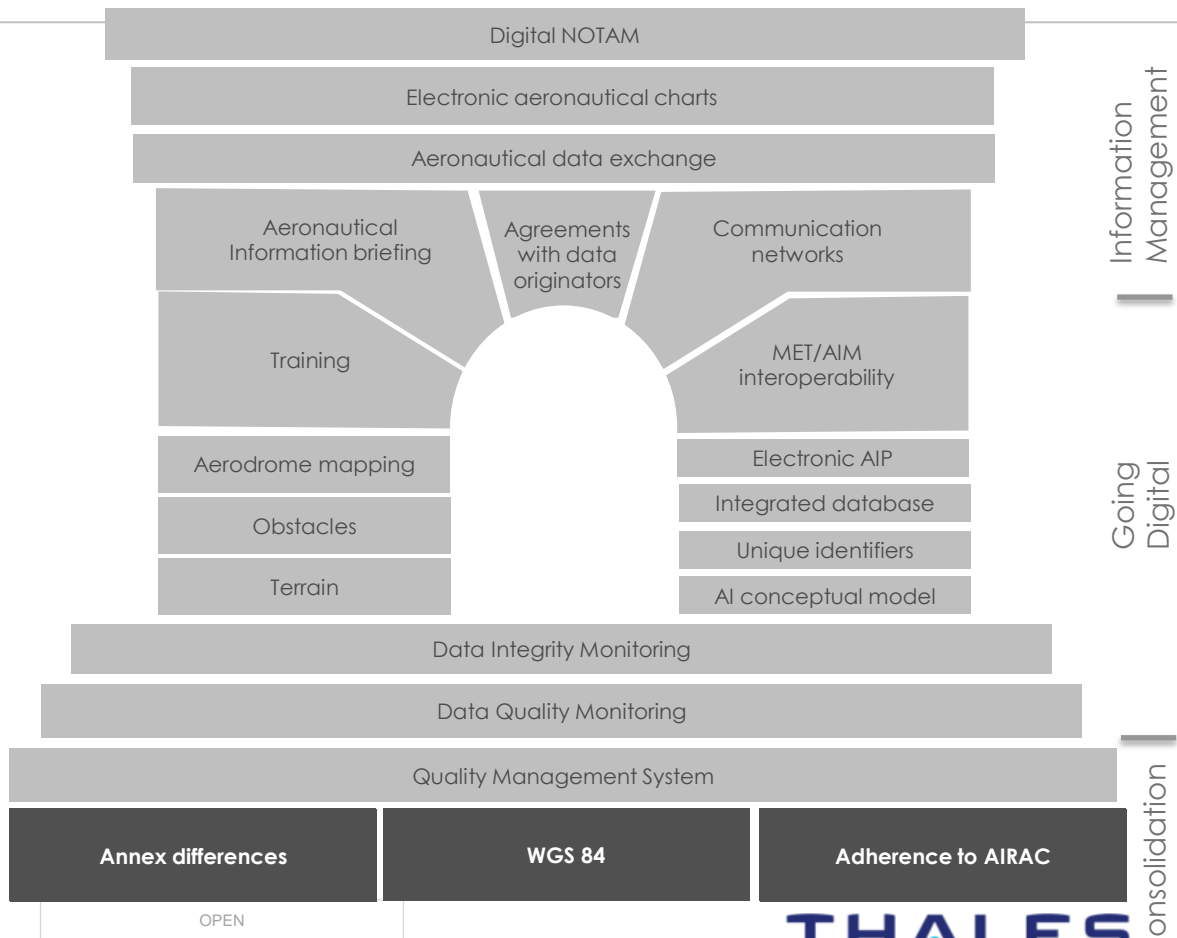
Demo 3

■ **TOPLINK / AIM Gate** used as **DNOTAM Hub/Backbone** collecting DNOTAM from different providers and distributing them to subscribers (Eurocontrol, FAA, ...)

Inter-operability	Integration of many configurable communication interfaces
	Validation of interfaces with several tools from AIM industries
	Interoperability with external AIM databases

OPEN

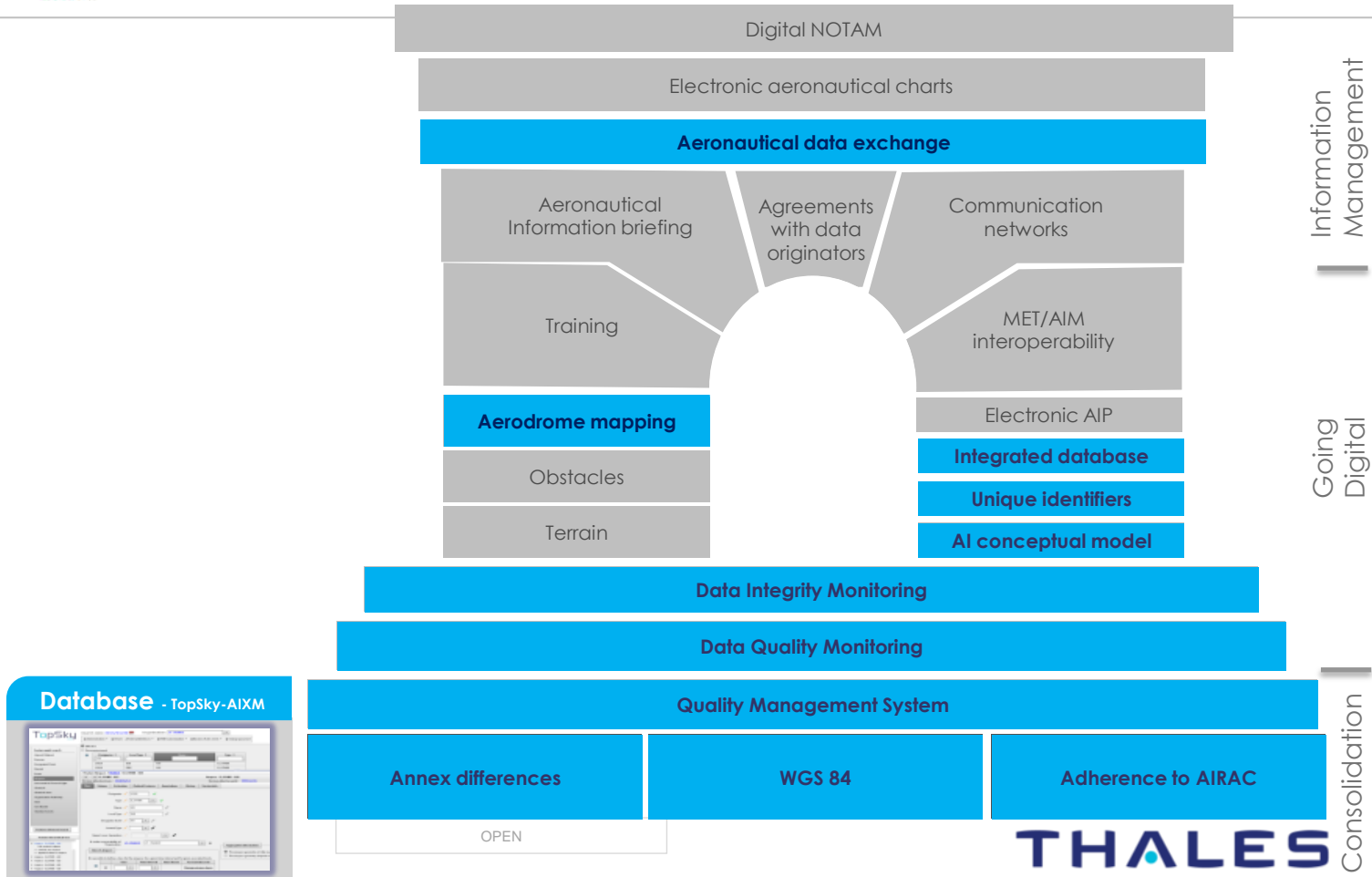
6-TopSky^{AIM} contribution for ICAO AIS to AIM Roadmap



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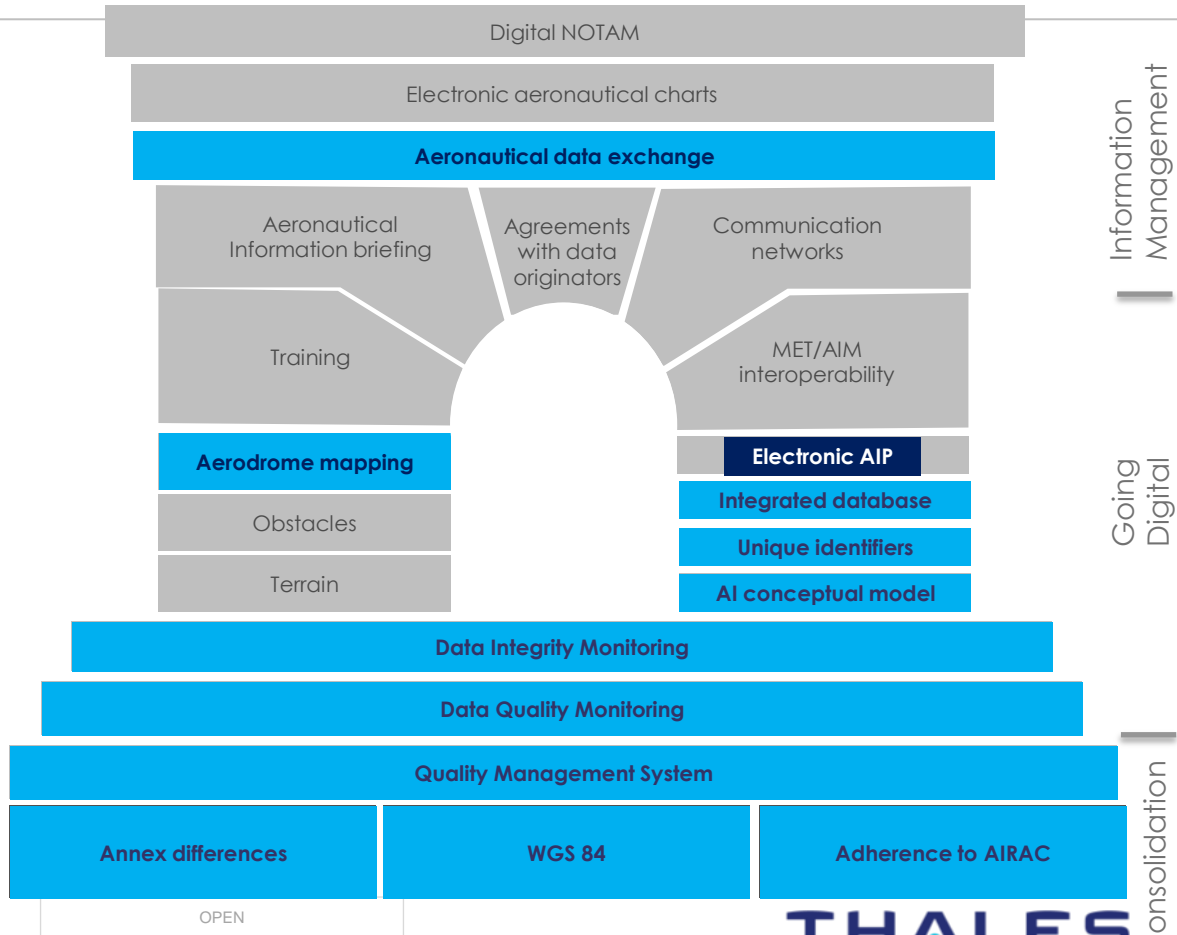
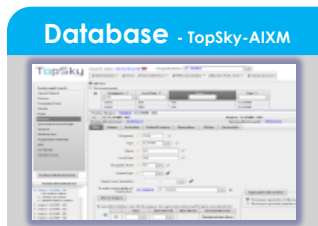
6 - TopSky AIM contribution for ICAO AIS to AIM Roadmap

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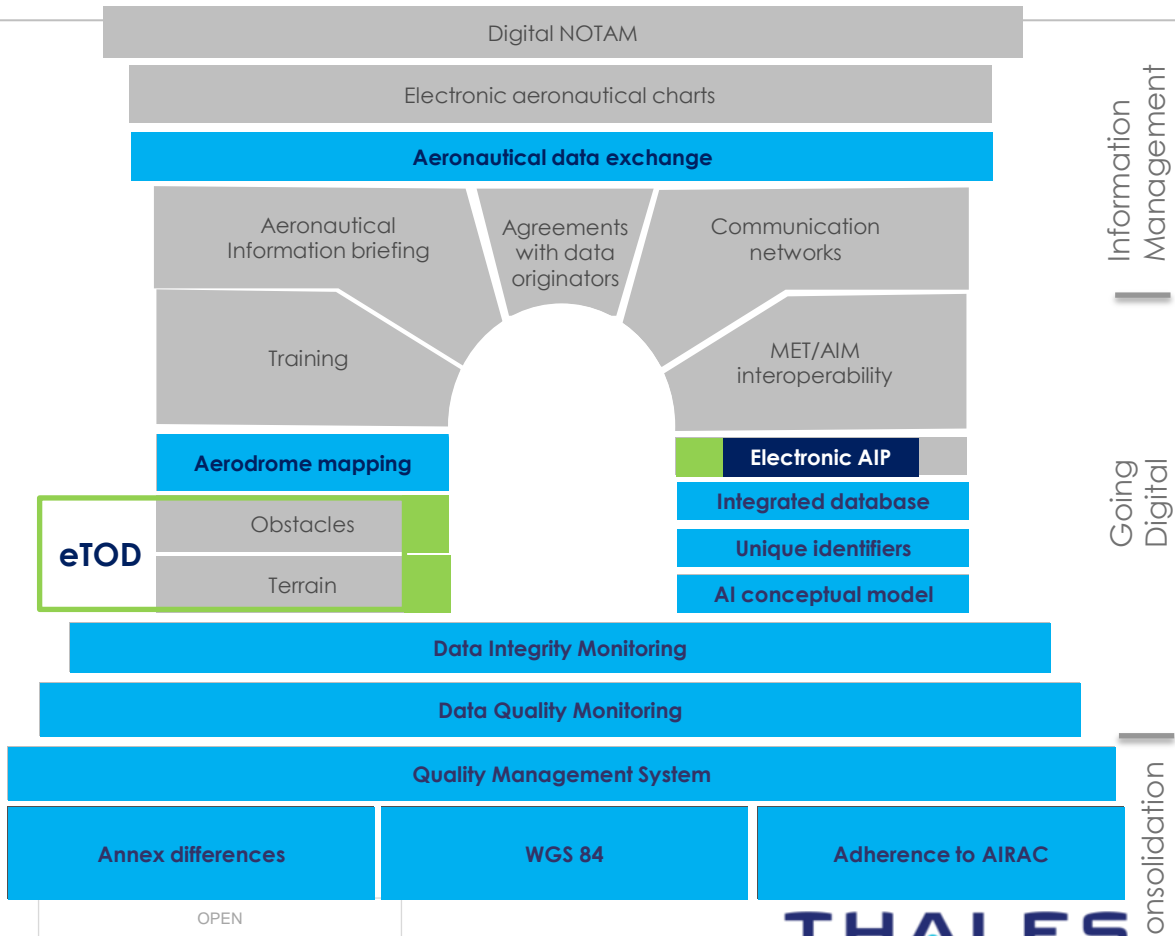
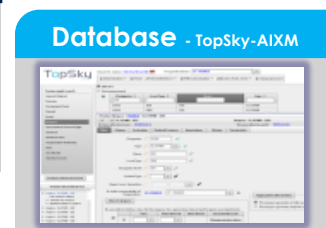
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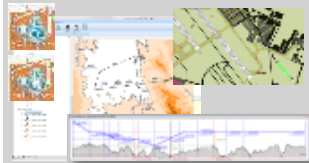
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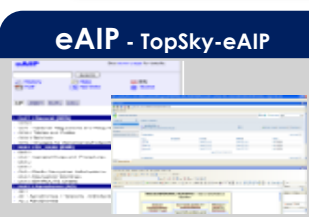
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Charts - Chart4Flight®




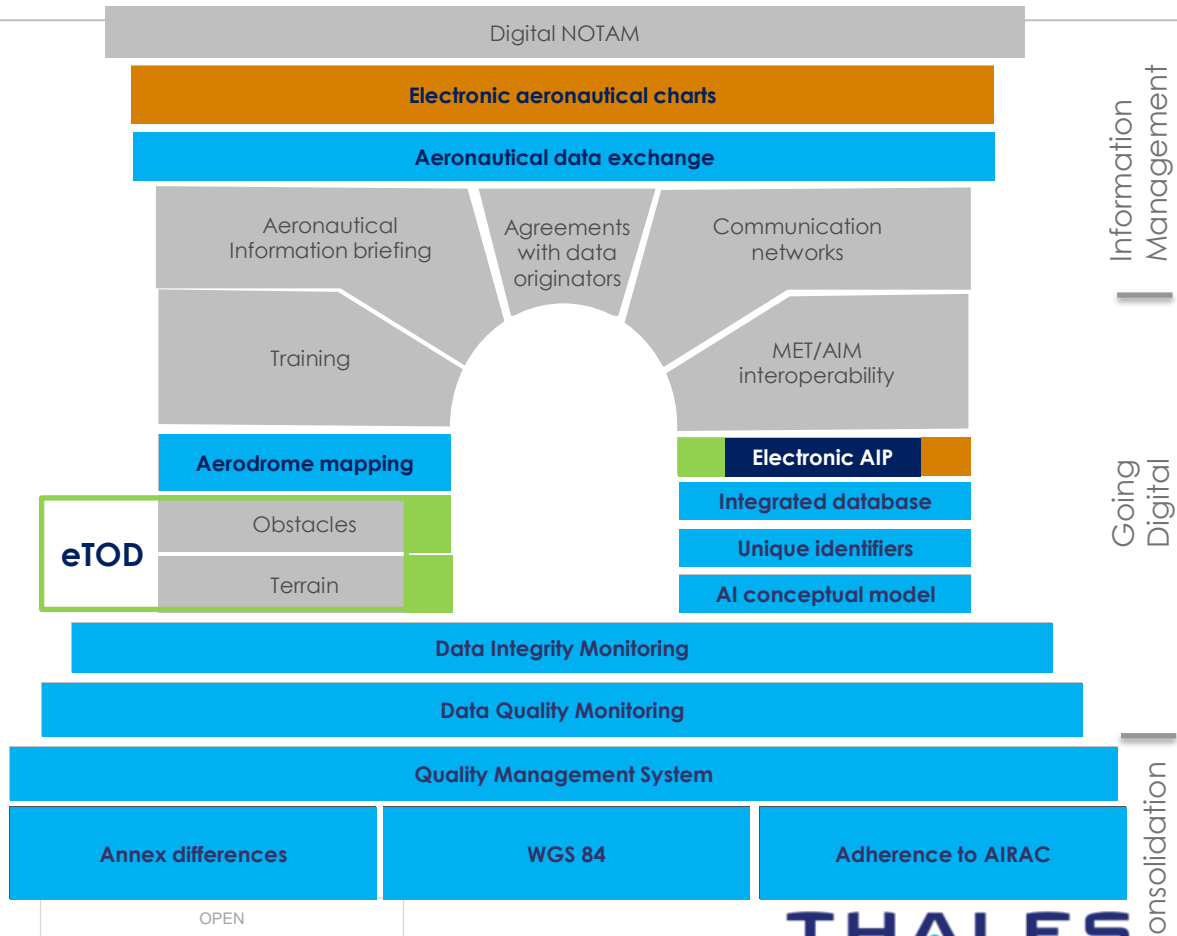
eAIP - TopSky-eAIP



Procedures - GéoTITAN® Data4Flight®



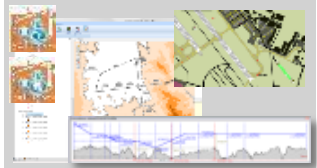
Database - TopSky-AIXM

6 - TopSky AIM contribution for ICAO AIS to AIM Roadmap

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eAIP - TopSky-eAIP

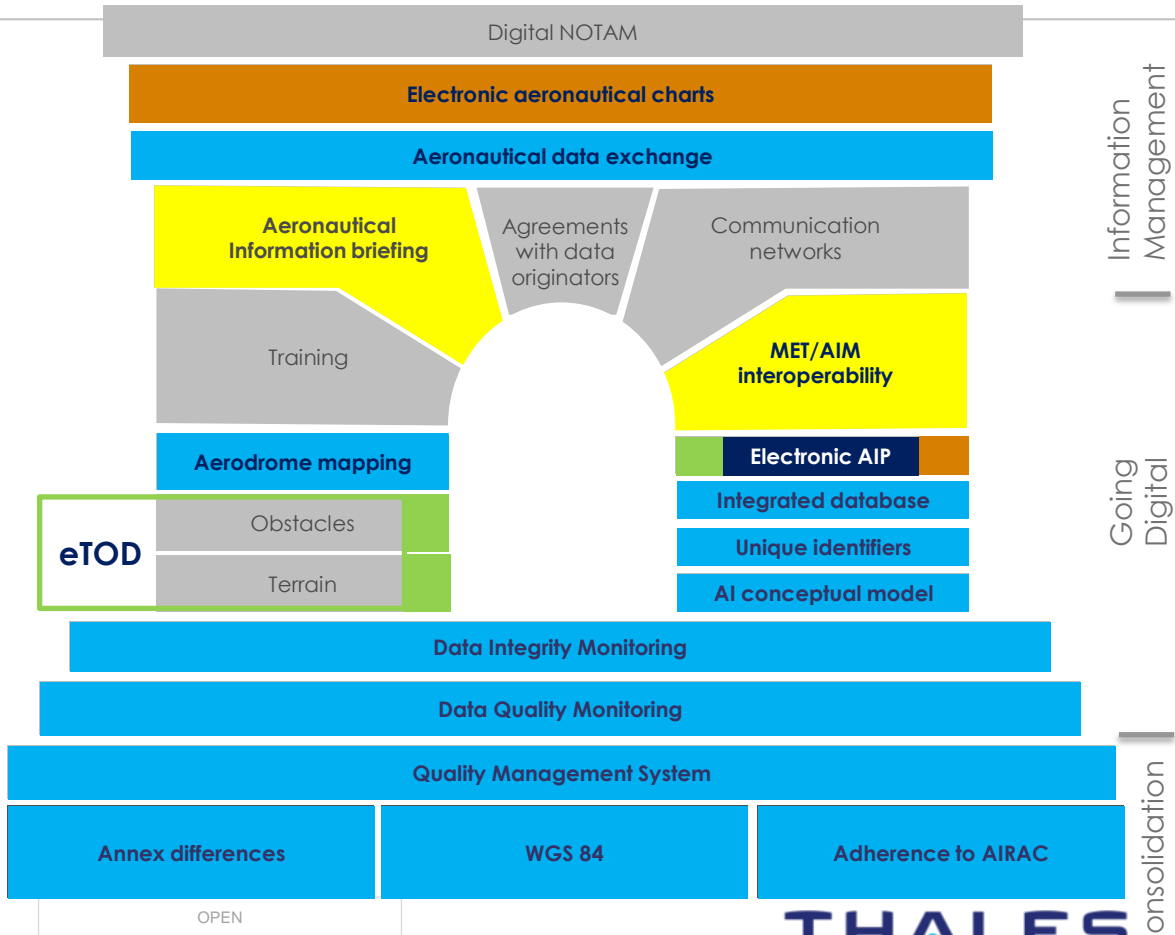


AIS - TopSky-AIS

ARO, NOF, MET, Briefing

Procedures - GéoTITAN® Data4Flight®

Database - TopSky-AIXM



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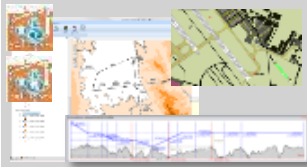
Training Catalogue

39		TopSky - AM - Maintenance Course	3d	AT001
40		TopSky - AS - Maintenance Course	4d	AT002
41	Hands-on	TopSky - B - Administration Course	3d	AT003
42		TopSky - ARO - Operator Course	2d	OP1
43		TopSky - AOP - Operator Course	2d	OP2
44		TopSky - AS - NOF & ARO Operator Course	4d	OP3
45		TopSky - AS - NOF Operator Course	2d	OP4
46	Advanced	TopSky - AS - ARO Operator Course	4d	OP5
47	Hands-on	GéoTITAN - Initial Training Course	2d	OP6
48	Advanced	GéoTITAN - On-site Training Course	4d	OP7
49	Hands-on	GéoTITAN - On Site Training Course	2d	OP8
50		Chart4Flight® - Course	2d	OP9
51		Procedure Group 1 - Course	2d	OP10
52		Chart4Flight® - Course	2d	OP11
53	Advanced	Obstacle Limitation Parameters (OLP) - Course	2d	OP12
54		Electronic Terrain and Obstacle Data (E-TOD) - Course	2d	OP13
55		Airspace4Flight - Course	2d	OP14

AIS - TopSky-AIS

ARO, NOF, MET, Briefing

Charts - Chart4Flight®

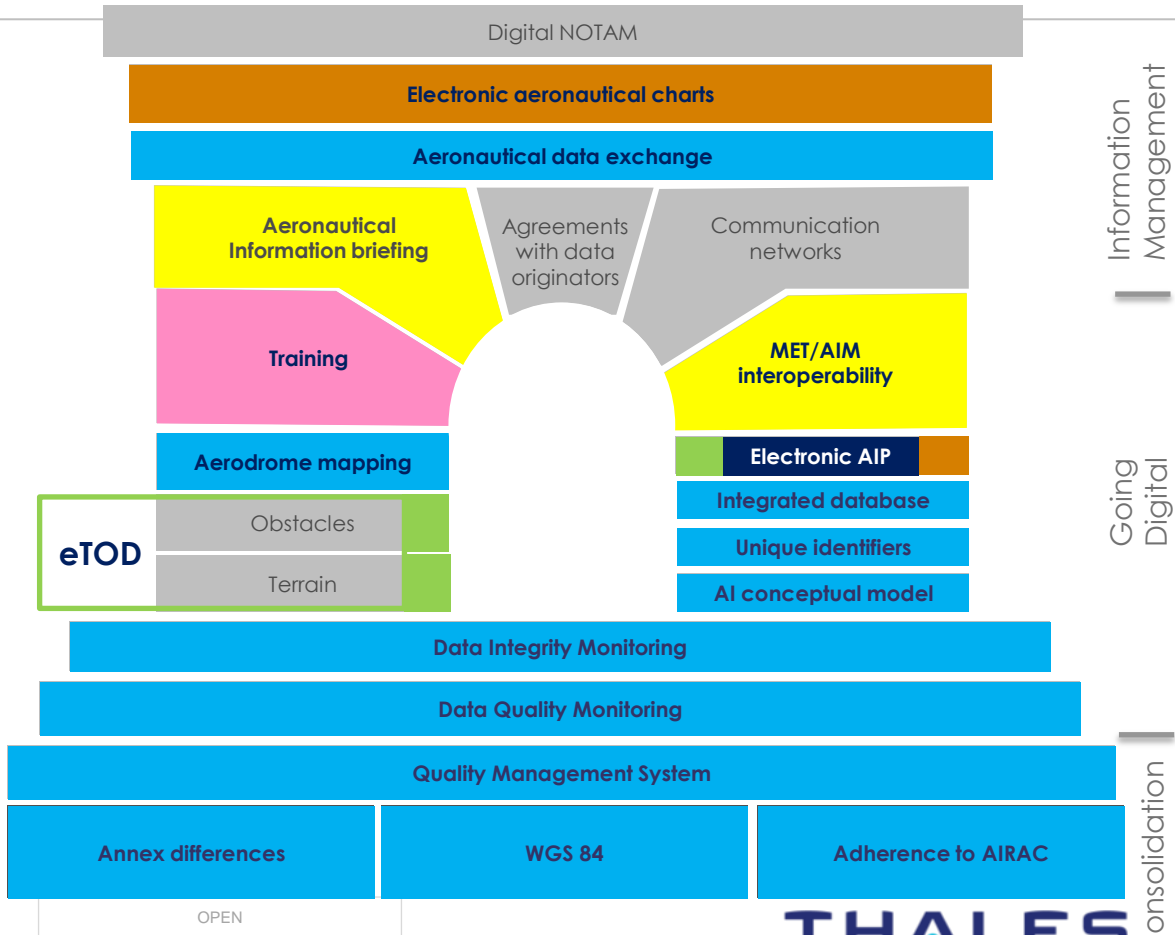


Procedures - GéoTITAN® Data4Flight®

eAIP - TopSky-eAIP



Database - TopSky-AIXM

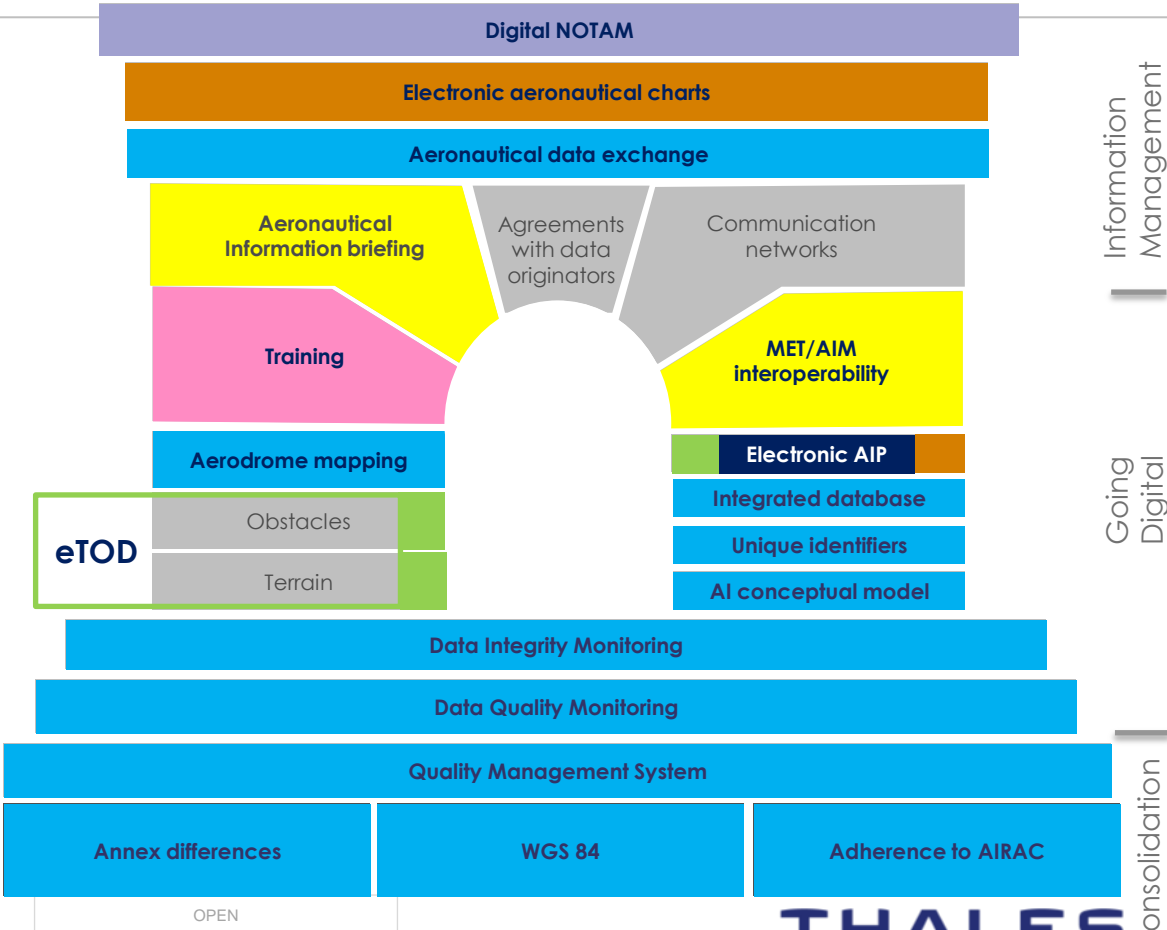
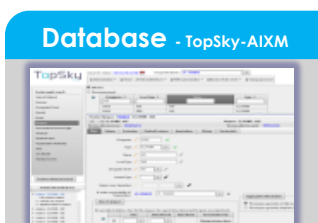
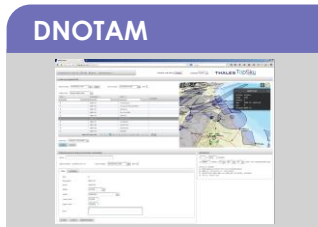
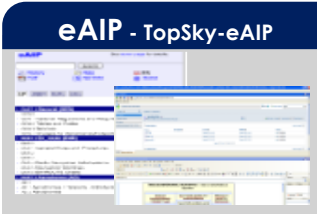
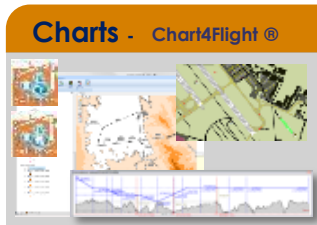


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Training Catalogue

39	Handson	TopSky - AIM - Maintenance Course	3d	AT001
40		TopSky - AIS - Maintenance Course	3d	AT002
41		TopSky - B - Administration Course	3d	AT003
42		TopSky - ARO - Operator Course	3d	OP1
43		TopSky - AAR - Operator Course	3d	OP2
44		TopSky - AS - NOF & ARO Operator Course	3d	OP3
45		TopSky - AIS - NOF Operator Course	3d	OP4
46	Adv-entred	TopSky - AS - ARO Operator Course	3d	OP5
47	Handson	GéoTITAN - Initial Training Course	3d	OP6
48	Adv-entred	GéoTITAN - On-the-Training Course	3d	OP7
49	Handson	Chart4Flight® - Course	3d	OP8
50		Procedures GéotITAN® - Course	3d	OP9
51		Chart4Flight® - Course	3d	OP10
52		Obstacle Limitation Surfaces (OLS) - Course	3d	OP11
53	Adv-entred	Electronic Terrain and Obstacle Data (E-TOD) - Course	3d	OP12
54		Airspace4Flight - Course	3d	OP13



Conclusion

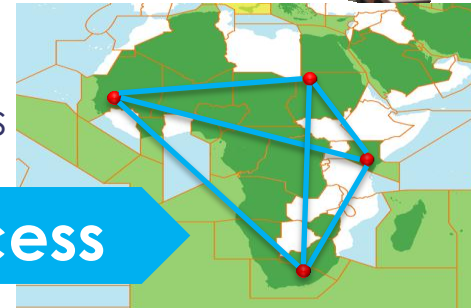
Thales plays a Key role in AIM in Africa

- Key References - Large AIM system with full AIM offer
- Largest ATM installed base
- Long term roadmap with AIM/ATM integrated solution

Thales is committed to play a Key Role in AFICAD

- Largest AIM references in Africa
- Possibility to propose services along with our ANSP partners
- Strong know-how in all key ATM and Cyber Security domains

Thales is committed to make AFICAD a success





Thank you for your attention !