

THALES



AIM/SWIM Challenges/Opportunities with **TopSky-AIM** product line

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

Hervé Puget – TopSky-AIM Product Line Manager



THALES



AIM/SWIM Challenges/Opportunities with **TopSky-AIM** product line

- 1 – AIM IN THE HEART OF THALES
- 2 – AIM & ASBU ROADMAP, WHATS NEXT ?
- 3 – TOPLINK / AIM GATE, WITHIN SESAR
- 4 – SWIM GLOBAL DEMO EXPERIANCE
- 5 – CONTRIBUTION FOR ICAO AIS TO AIM ROADMAP



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

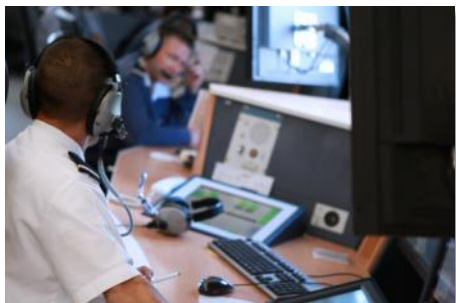
Airport & Air **Traffic** Management



Flight Avionics



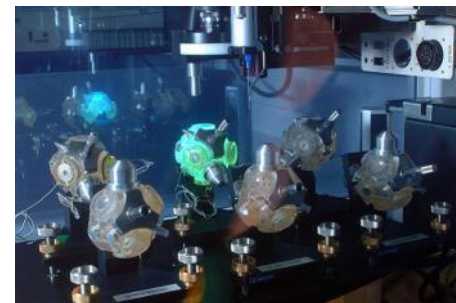
Unmanned Aerial **Vehicles** systems



Command & **Control** Centres - Air Operations



Critical Information and **Cybersecurity**



Navigation Solutions

This document may not be reproduced, modified, adapted, published, translated, in any way, in whole or in part or disclosed to a third party without the prior written consent of Thales - © Thales 2016 All rights reserved.

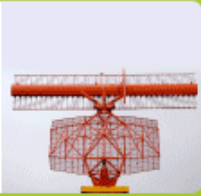
1- AIM part of ATM, THALES ATM solutions are trusted by 180 countries

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



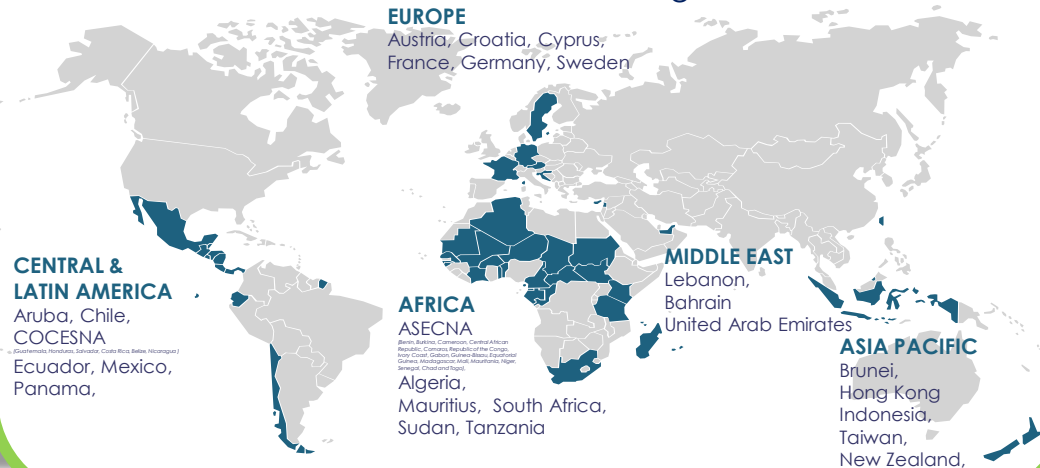
Over
25
Tower
Systems
in
operation



26 Aeronautical
Information
Mgt. Systems

1,800
ADS-B &
Multilateration Equip.

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



This document may not be reproduced, modified, adapted, published, translated, in any way, in whole or in part or disclosed to a third party without the prior written consent of Thales - © Thales 2016 All rights reserved.

B1-AMET

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

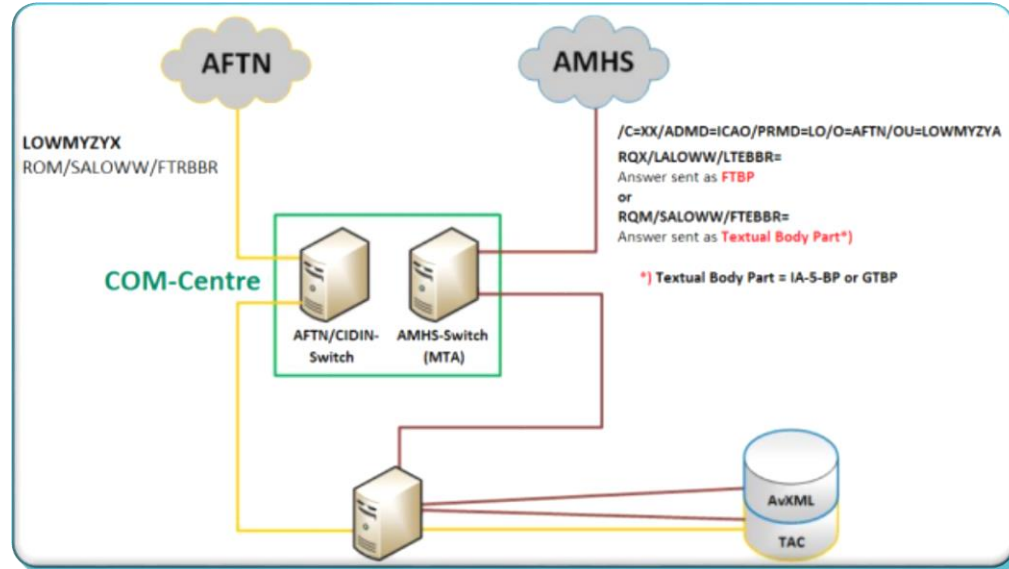
Effective on	Applicable (should)	Mandatory (Shall)
11 July 2016	10 November 2016	November 2018 (or 2019)

Sep 2016 : In Europe, IWXXM messages from AustroControl and BelgoControl are being exchanged on test-COM Centres via the test-PENS.

The switching of data using AMHS with file-transfer body-part is working well !

AustroControl is operating Thales TopSky-AMHS switch.

From Nov 2016,
AIS Briefings may include
digital Meteo information !



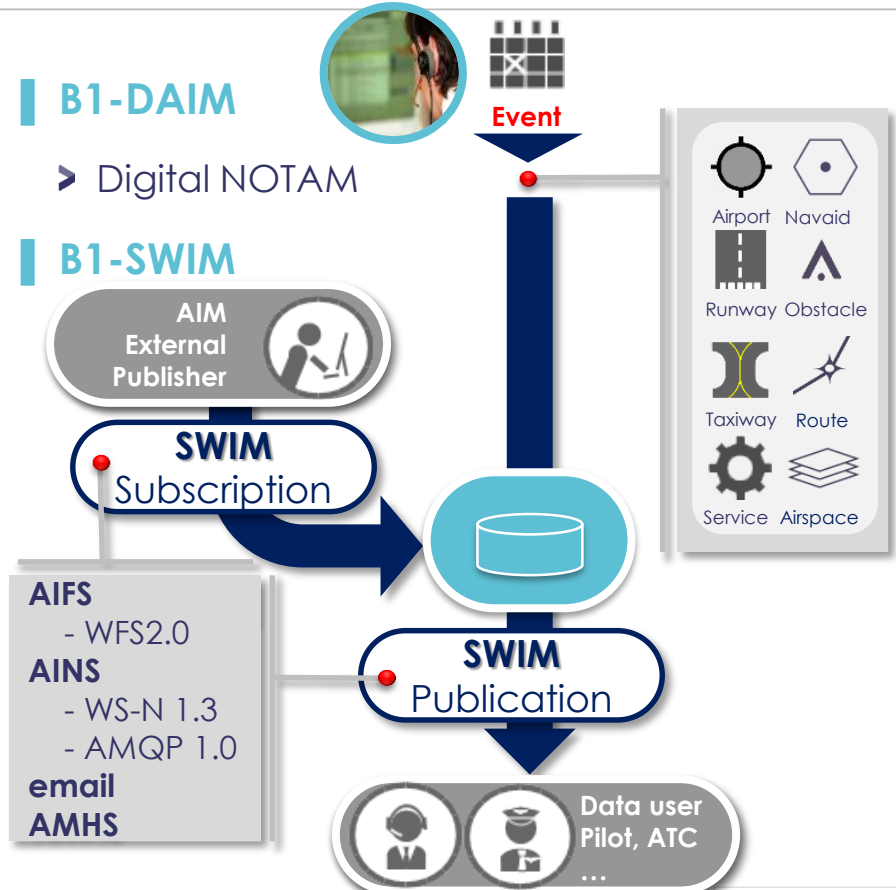
ICAO (EUR Doc 033) First Edition – 2016
Concept of Operations for the Transition of OPMET Data Exchange using IWXXM

This document may not be reproduced, modified, adapted, published, in any way, in whole or in part or disclosed to a third party without the prior written consent of Thales - © Thales 2016 All rights reserved.

B1-DAIM

- Digital NOTAM

B1-SWIM



Significant changes foreseen on ICAO Annex15 & PANS-AIM

- AIM ANSP primary focus may definitely be on the **Digital AIM data set** maturity and distribution. Such as stored in AIXM database & distribute through SWIM or AMHS

“When the AIP Data Set ... is provided, ... sections of the AIP may be left blank and a reference to the data set availability shall be provided”

AIS-AIMSG/12-SoD
23/10/2015
Montreal

This document may not be reproduced, modified, adapted, published, in any way, in whole or in part or disclosed to a third party without the prior written consent of Thales - © Thales 2016 All rights reserved.

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



Strengths of DNOTAM within TOPLINK

Design	Cybersecurity at the earth of the design / packaging
	Deployed and validated in a Cloud environment
	Performance optimized for Huge Volume (world)
Ergonomic	Used by Eurocontrol to validate Digital NOTAM Event specification (SESAR WP13.2.2 exercises)
	Optimized and validated by Operation trial (SESAR LSDA TOPLINK exercises)
	Minimizing NOF knowledge background and subsequent validation / correction
Functions	Multi NOF management
	Roles and User rights management
	Multiple graphical viewers management Cesium (3D), GoogleMaps, OpenLayers 3



<https://aim.toplink.thalesgroup.com/DigitalNotam/>

This document may not be reproduced, modified, adapted, published, translated, in any way, in whole or in part or disclosed to a third party without the prior written consent of Thales - © Thales 2016 All rights reserved.

3- TOPLINK/AIM Gate, AIP SUP & DNOTAM / Special Practical use case

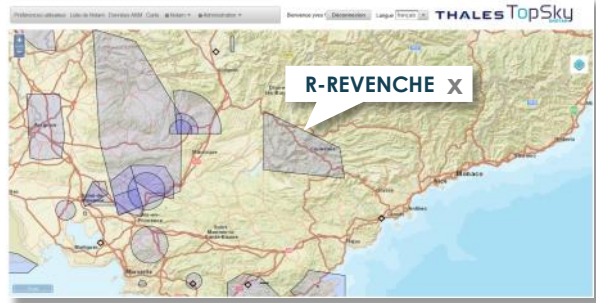
This document may not be reproduced, modified, published, translated, in any way, in whole or in part or disclosed to a third party without the prior written consent of Thales - © Thales 2016 All rights reserved.

Creating an AIP SUP from Digital NOTAM

```

R007016 NOTAMN
Q) LFMMQRCRCA/BOW/0000196435N00628E015
A) LFMMQRCRCA/BOW/0000196435N00628E015
C) SEP 12 0630-0900 SEP 12 1130-1330 SEP 12 1815-2130 SEP 13
0630-0900 SEP 13 1300-2030 SEP 14 0630-0900 SEP 14 1815-2130 SEP 15
0630-1200 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 000133E - 435137N 000414E - 434329N 0004328E - 434547N
0001324E - 440130N 000133E
RAMBERT INFO: 143 500 MHz / 317 500 MHz
MARSEILLE INFO: 124 500 MHz / 120 500 MHz
MARSEILLE CTL: 127 800 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 94 02 11 80
OPERATIONS MANAGER OF THE EMBARKED AIR GROUP
PHONE: +33(0)2 22 08 95 52 OR +33(0)4 94 02 10
DURING THE EXERCISE
CONTROL AND REPORTING CENTRE
(CRC) OF LYON MONTVERDUN
PHONE: +33(0)4 78 14 65 21
SHIFT MANAGER OF THE CHARLES DE GAULLE AIRCRAFT CARRIER
PHONE: +33(0)4 94 02 11 80
OPERATIONS MANAGER OF THE EMBARKED AIR GROUP
PHONE: +33(0)4 94 02 10 93
TEMPORARY RESTRICTED AREA (ZRT) COEXISTING WITH THE CONTROLLED
AIRSPACE AND REPLACING THE RESTRICTED AREAS WITH WHICH IT OVERLAPS
GAT / MIL AIR TRAFFIC
COMPLUSORY 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) FL1000 (c) FL195
    
```

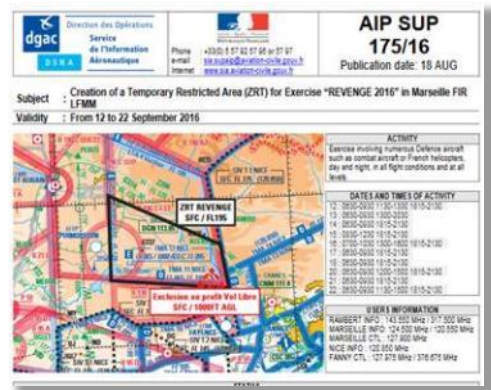


The associated graphical view

+

And automatic conversion to ICAO NOTAM

=



Substitute the creation of an AIP SUP Simple & Secure !



Create the DNOTAM for a Temporary Restricted ZRT



OPEN

- 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, ...)

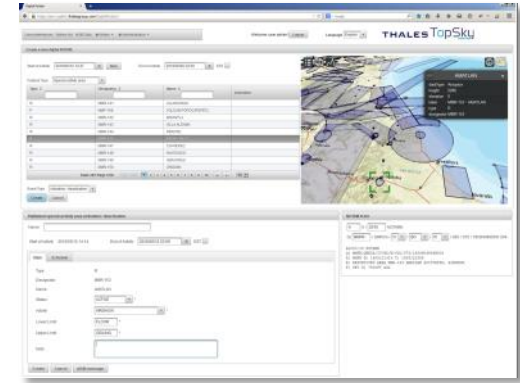
Inter-operability	Integration of many configurable communication interfaces
	Validation of interfaces with several tools from AIM industries
	Interoperability with external AIM databases

This document may not be reproduced, modified, adapted, published, translated, in any way, in whole or in part or disclosed to a third party without the prior written consent of Thales - © Thales 2016 All rights reserved.

4- THALES **DNOTAM** deployment benefits

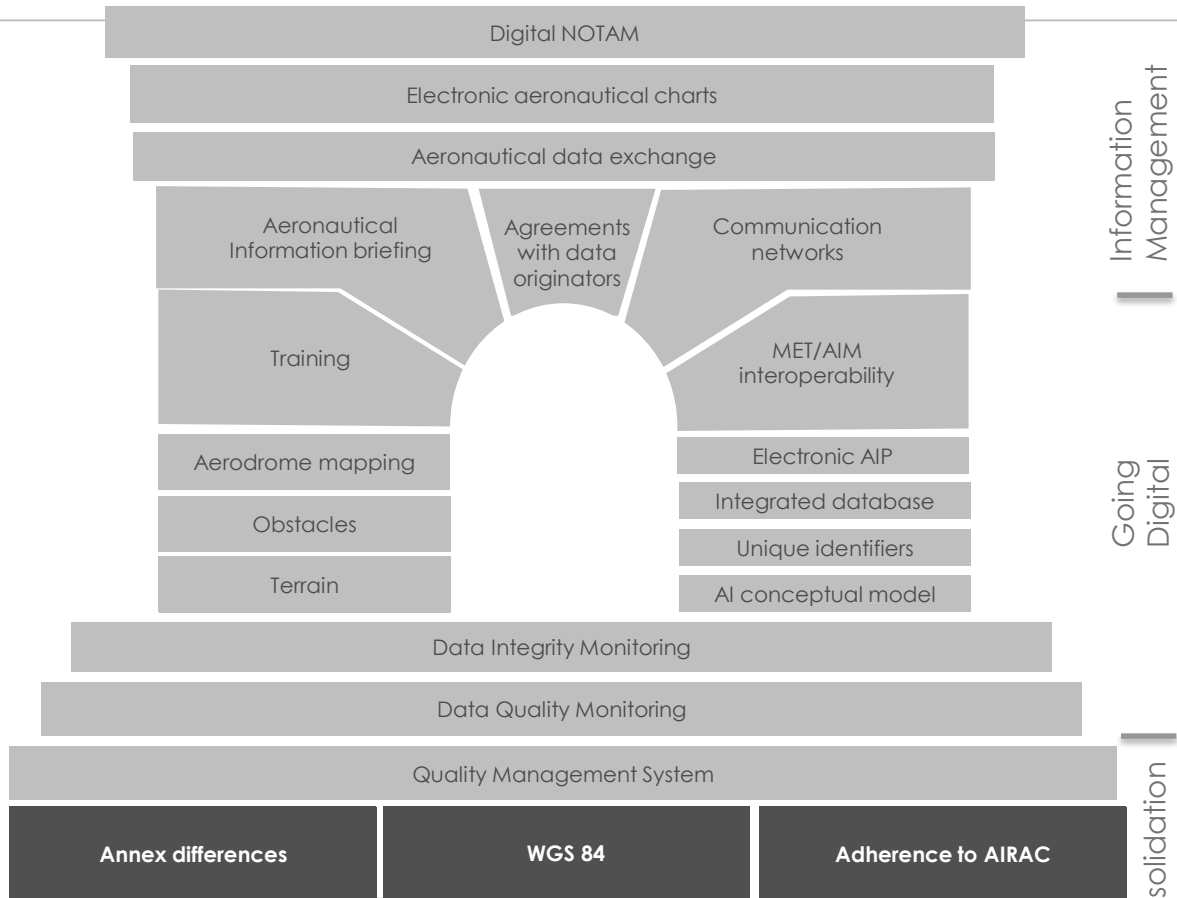
Follow **ICAO Roadmap BLOCK1** and be One step ahead with Thales **DNOTAM** !

- **Means for regional AIM foundation** with a design taking care upfront of World area performance, Cloud deployment and Cybersecurity.
- **Reduce input, inaccuracy, interpretation errors** by providing secured, forced, un-ambiguous Event-AIXM5 interface for Aeronautical data originators : Airports, ANSP, Regional partners, ...
- **Develop quality enhanced services** by providing more accurate Aeronautical information through SWIM to : Airlines, AOC, ...
- **Minimize men resources required in your NOTAM Office** for NOTAM correction/validation
- **Offer an extendable platform ECOSystem** supporting digital models for MET (WXXM), Flight Plan (FIXM), ATFM ...



[OPEN](#)

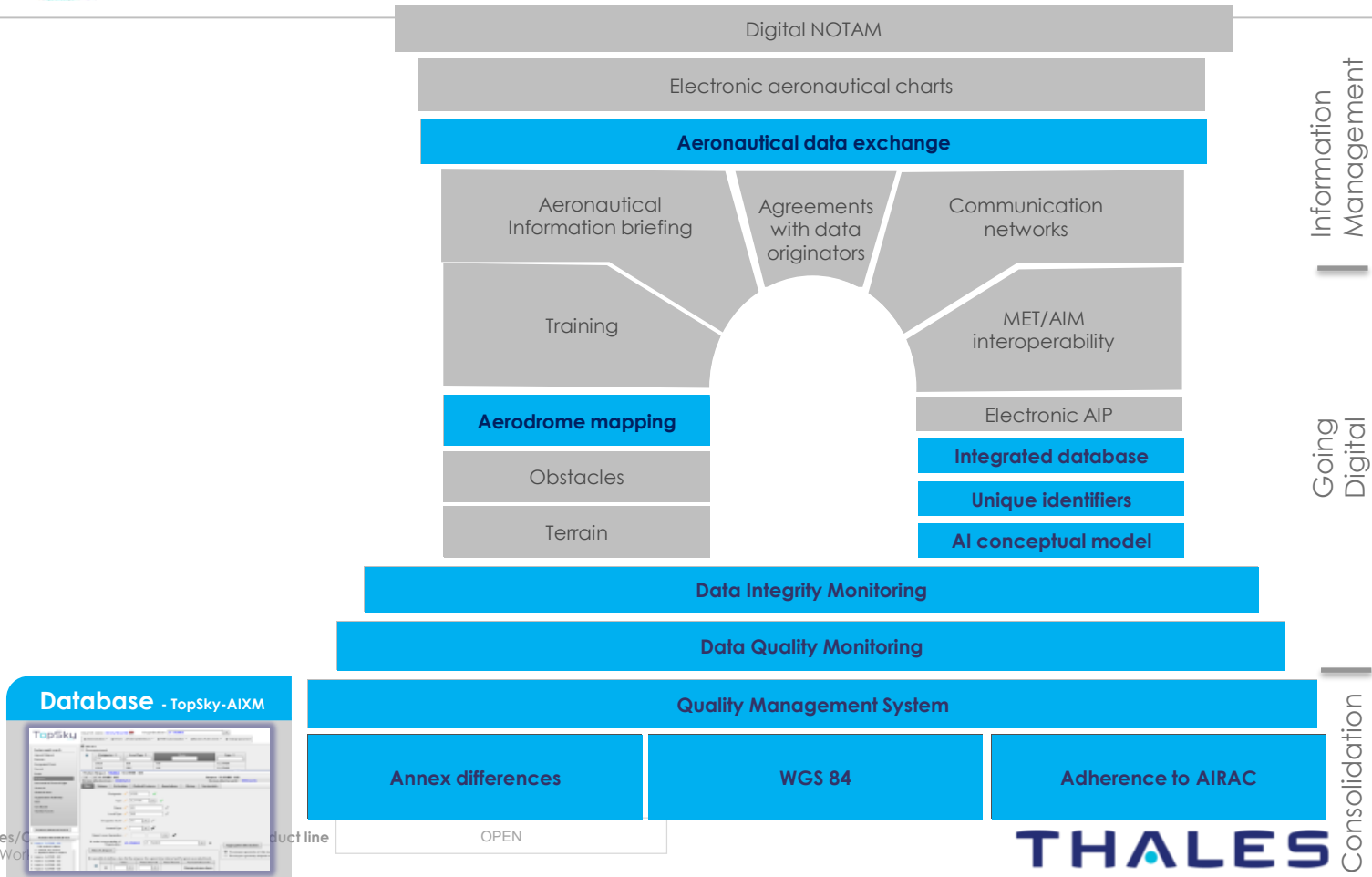
5 - TopSky contribution for ICAO AIS to AIM Roadmap



This document may not be reproduced, modified, adapted, published, translated, in any way, in whole or in part or disclosed to a third party without the prior written consent of Thales - © Thales 2016 All rights reserved.

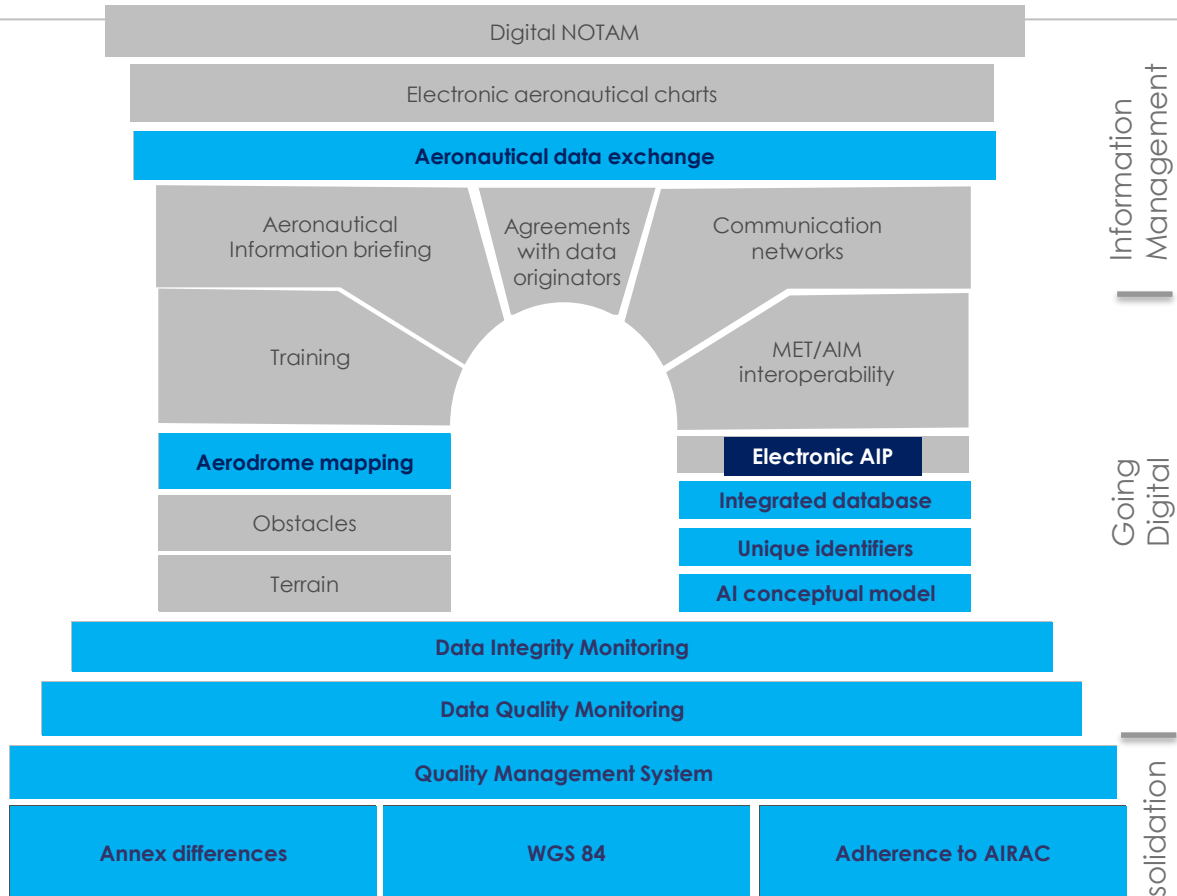
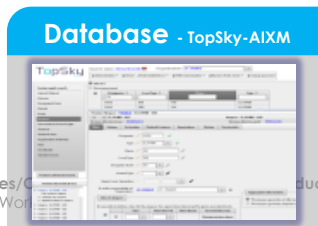
5 - TopSky contribution for ICAO AIS to AIM Roadmap

This document may not be reproduced, modified, adapted, published, translated, in any way, in whole or in part or disclosed to a third party without the prior written consent of Thales - © Thales 2016 All rights reserved.



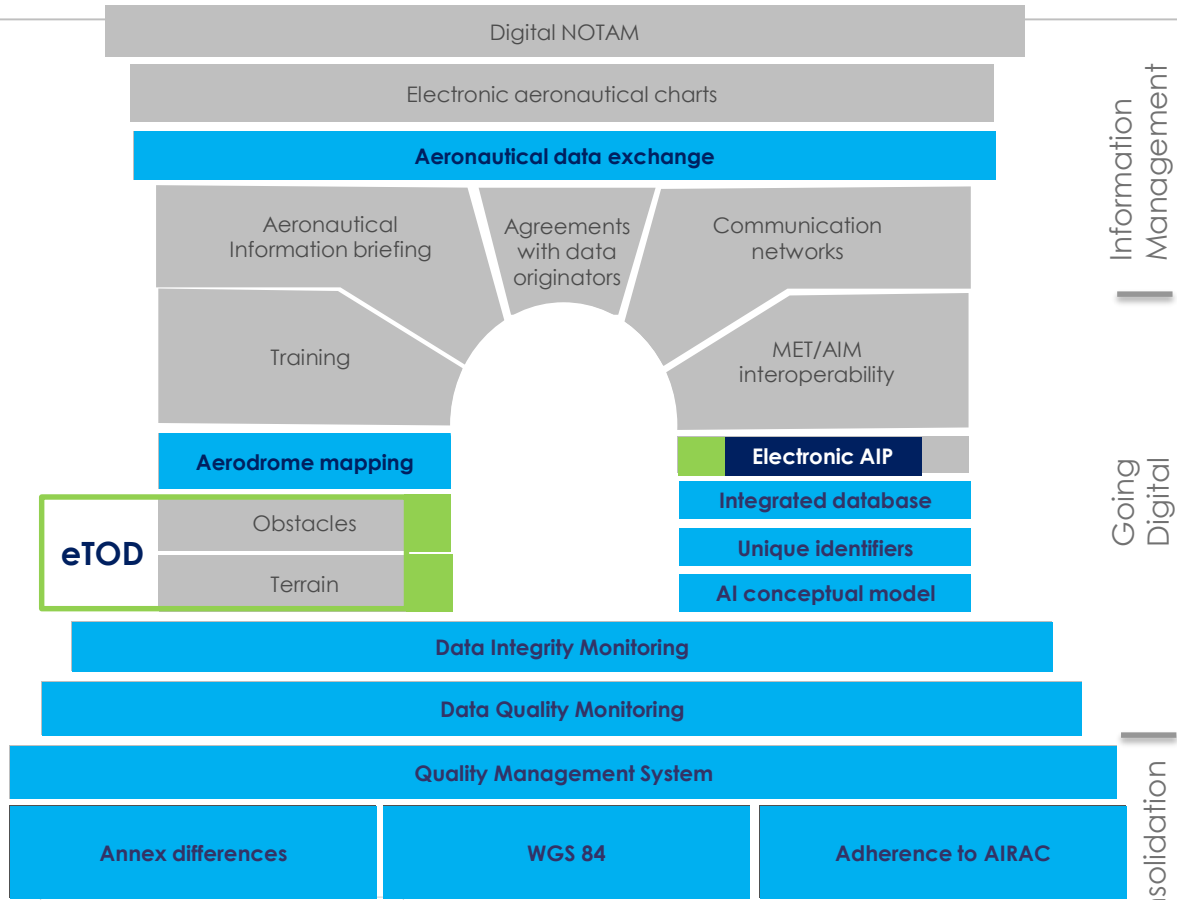
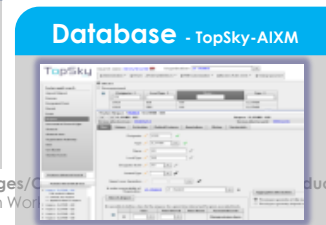
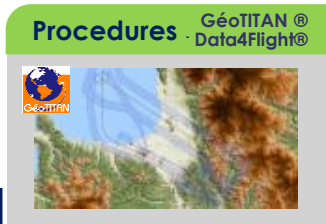
5 - TopSky contribution for ICAO AIS to AIM Roadmap

This document may not be reproduced, modified, adapted, published, translated, in any way, in whole or in part or disclosed to a third party without the prior written consent of Thales - © Thales 2016 All rights reserved.



5 - TopSky contribution for ICAO AIS to AIM Roadmap

This document may not be reproduced, modified, published, translated, in any way, in whole or in part or disclosed to a third party without the prior written consent of Thales - © Thales 2016 All rights reserved.



5 - TopSky contribution for ICAO AIS to AIM Roadmap

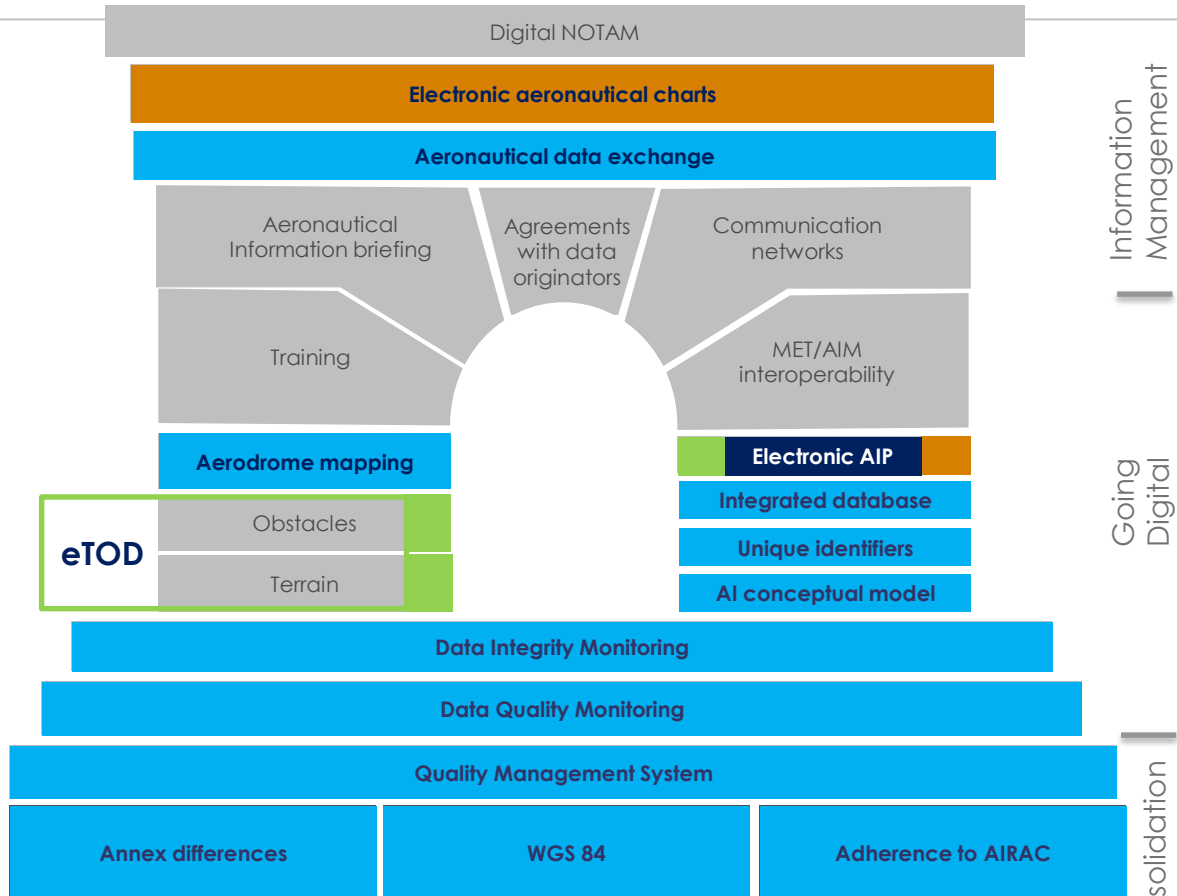
This document may not be reproduced, modified, adapted, published, translated, in any way, in whole or in part or disclosed to a third party without the prior written consent of Thales - © Thales 2016 All rights reserved.

Charts - Chart4Flight®

Procedures - GéoTITAN® Data4Flight®

eAIP - TopSky-eAIP

Database - TopSky-AIXM



Information Management

Going Digital

Consolidation

5 - TopSky contribution for ICAO AIS to AIM Roadmap

This document may not be reproduced, modified, adapted, published, translated, in any way, in whole or in part or disclosed to a third party without the prior written consent of Thales. - @Thales 2016 All rights reserved.

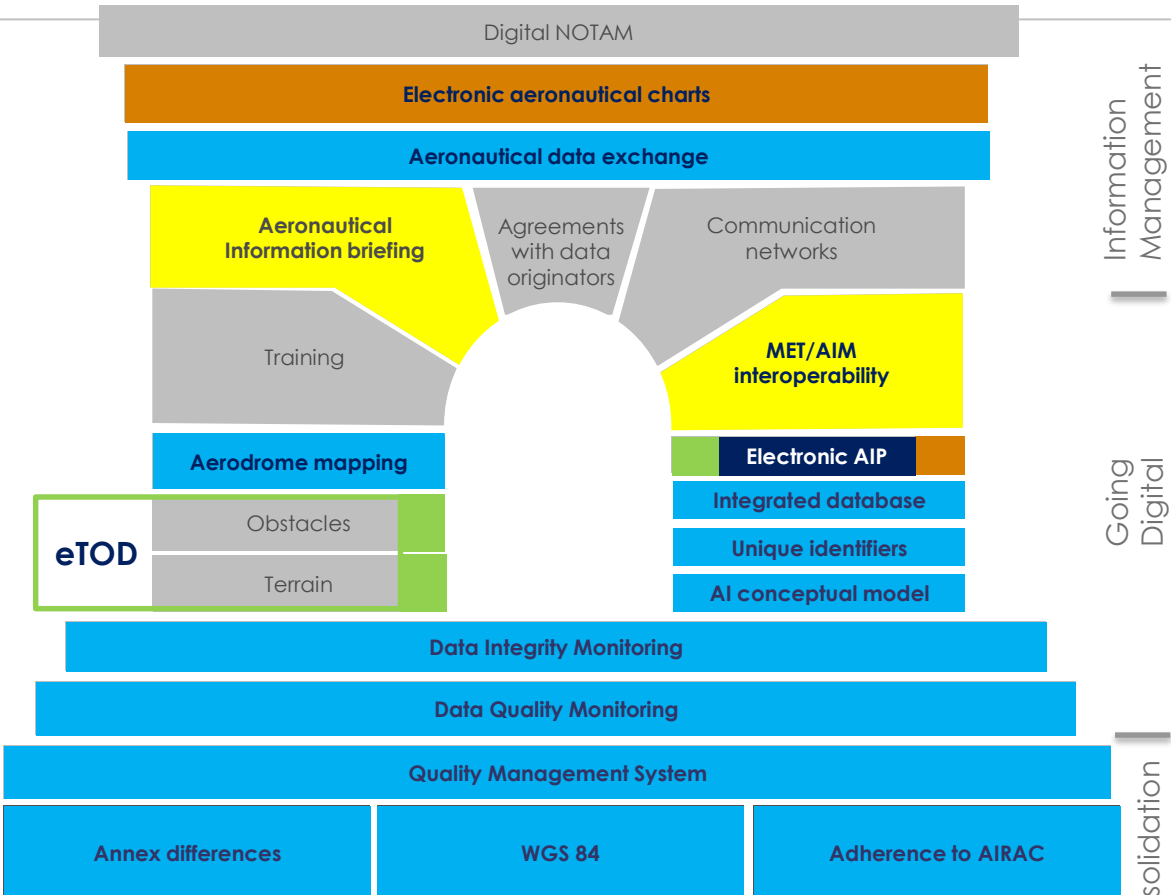
Charts - Chart4Flight®

eAIP - TopSky-eAIP

AIS - TopSky-AIS
ARO, NOF, MET, Briefing

Procedures - GéoTITAN® Data4Flight®

Database - TopSky-AIXM



5 - TopSky contribution for ICAO AIS to AIM Roadmap

This document may not be reproduced, modified, adapted, published, in any way, in whole or in part or disclosed to a third party without the prior written consent of Thales - © Thales 2016 All rights reserved.

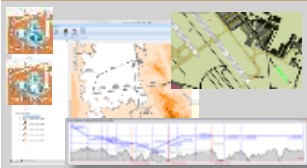
Training Catalogue

ID	Category	Course Name	Start Date
37		TopSky AIM - Maintenance Course	30/01/2016
40		TopSky AE - Maintenance Course	02/02/2016
41	Navigation	TopSky B - Administration Course	04/02/2016
42		TopSky AIM - Operator Course	04/02/2016
43		TopSky-ARF - Operator Course	04/02/2016
44		TopSky AE - I/OP & ARO Operator Course	04/02/2016
45		TopSky AE - I/OP Operator Course	04/02/2016
46	Adv services	TopSky AE - ARO Operator Course	04/02/2016
47	Navigation	GeoTITAN - In-Box Training Course	04/02/2016
48	Adv services	GeoTITAN - On-Box Training Course	04/02/2016
49		GeoTITAN - On-Box Training Course	04/02/2016
50	Navigation	DomestFlight - Course	25/02/2016
51		Procedure Storage/Tools - Course	25/02/2016
52		Chart4Flight - Course	25/02/2016
53	Adv services	Obstacle Clearance Database (OCDB) - Course	25/02/2016
54		Electronic Terrain and Obstacle Data (E-TOD) - Course	25/02/2016
55		AltimeterFlight - Course	25/02/2016

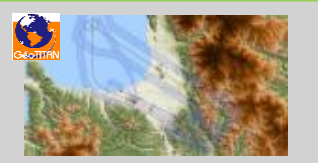
AIS - TopSky-AIS

ARO, NOF, MET, Briefing

Charts - Chart4Flight®



Procedures - GéoTITAN® Data4Flight®



eAIP - TopSky-eAIP



Database - TopSky-AIXM



Digital NOTAM

Electronic aeronautical charts

Aeronautical data exchange

Aeronautical Information briefing

Agreements with data originators

Communication networks

Training

MET/AIM interoperability

Aerodrome mapping

Electronic AIP

eTOD

- Obstacles
- Terrain

Integrated database

Unique identifiers

AI conceptual model

Data Integrity Monitoring

Data Quality Monitoring

Quality Management System

Annex differences

WGS 84

Adherence to AIRAC

Information Management

Going Digital

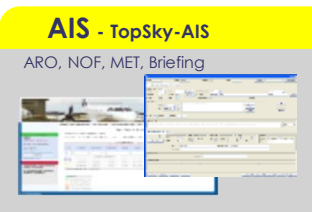
Consolidation

5 - TopSky contribution for ICAO AIS to AIM Roadmap

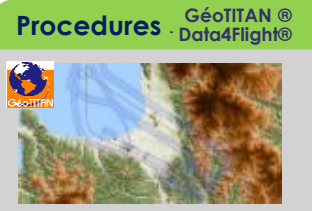
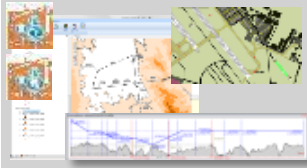
This document may not be reproduced, modified, adapted, published, in any way, in whole or in part or disclosed to a third party without the prior written consent of Thales - © Thales 2016 All rights reserved.

Training Catalogue

ID	Category	Course Name	Start	End
39	Hazardous	TopSky AIM - Maintenance Course	30/01/2016	30/01/2016
40		TopSky AIM - Maintenance Course	30/01/2016	30/01/2016
41		TopSky AIM - Administration Course	30/01/2016	30/01/2016
42		TopSky AIM - Operator Course	30/01/2016	30/01/2016
43	Adm services	TopSky AIM - Operator Course	30/01/2016	30/01/2016
44		TopSky AIM - NOF & ARO Operator Course	30/01/2016	30/01/2016
45		TopSky AIM - NOF Operator Course	30/01/2016	30/01/2016
46		TopSky AIM - ARO Operator Course	30/01/2016	30/01/2016
47	Hazardous	GeoTITAN - Initial Training Course	01/01/2016	01/01/2016
48		GeoTITAN - Initial Training Course	01/01/2016	01/01/2016
49		GeoTITAN - On Job Job Training Course	01/01/2016	01/01/2016
50		GeoTITAN - On Job Job Training Course	01/01/2016	01/01/2016
51	Hazardous	Chart4Flight - Course	01/01/2016	01/01/2016
52		Chart4Flight - Course	01/01/2016	01/01/2016
53		Chart4Flight - Course	01/01/2016	01/01/2016
54		Chart4Flight - Course	01/01/2016	01/01/2016
55	Adm services	Electronic Name and Obstacle Data (E-NOE) - Course	01/01/2016	01/01/2016
56		Altitude Flight - Course	01/01/2016	01/01/2016



Charts - Chart4Flight®



eAIP - TopSky-eAIP



Digital NOTAM

Electronic aeronautical charts

Aeronautical data exchange

Aeronautical Information briefing

Agreements with data originators

Communication networks

Training

MET/AIM interoperability

Aerodrome mapping

Electronic AIP

eTOD

- Obstacles
- Terrain

Integrated database

Unique identifiers

AI conceptual model

Data Integrity Monitoring

Data Quality Monitoring

Quality Management System

Annex differences

WGS 84

Adherence to AIRAC

Information Management

Going Digital

Consolidation



Thank you for your attention !
Let's do a demo of TOPLINK / AIP Gate