



TopSky – ATC

AIDC Implementation Experiences

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- **Overview of TopSky-ATC**
- **Deployment in the CAR/SAM Region**
- **AIDC Implementation Experiences**
- **Future Enhancements**
- **Message from Thales**
- **Questions**

Overview of TopSky-ATC

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- The standard TopSky-ATC Product, developed by Thales, allows operational control to be performed using aircraft surveillance data (e.g. radar, ADS-B, WAM etc.), flight data and a display system.
- The TopSky-ATC system has evolved through various name changes since it was first launched in 1990.
- TopSky-ATC Product has had significant operational use in the field, taking into account different operating environments and users.
- Since 2002, over 64 TopSky-ATC systems have entered operational service amounting to over 560 controller working position.
- UK CAP670 and ED153 SWAL 4 compliant

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TopSky – ATC Supported AIDC Protocols

ATS Messages

OLDI 2.3

Full Basic Messages +
Transfer

APAC V2

All core messages + PAC

NAM Rev D

All messages

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AIDC Specifications and Lessons Learnt

- Different AIDC protocol per adjacent FIR

- APAC AIDC consists of core (mandatory) and optional messages;
NAM AIDC messages are defined by Classes;

- In practice, specifications are often tested/implemented in phases between adjacent centre

- AIDC messages consists of optional fields

- AIDC specifications may permit re-transmission of a previously sent message

- no LAM/LRM or
- update to exchanged parameters

- AIDC specification may require flight plan to be automatically created from a message if a flight plan does not already exist in the system

AIDC parameters per adjacent FIR in TopSky-ATC is highly configurable

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TopSky – ATC Deployment in the CAR/SAM Region

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- Aruba
- Bolivia
- Chile
- Colombia
- Dominican Republic
- Jamaica
- Mexico
- Panama
- Sint Maarten



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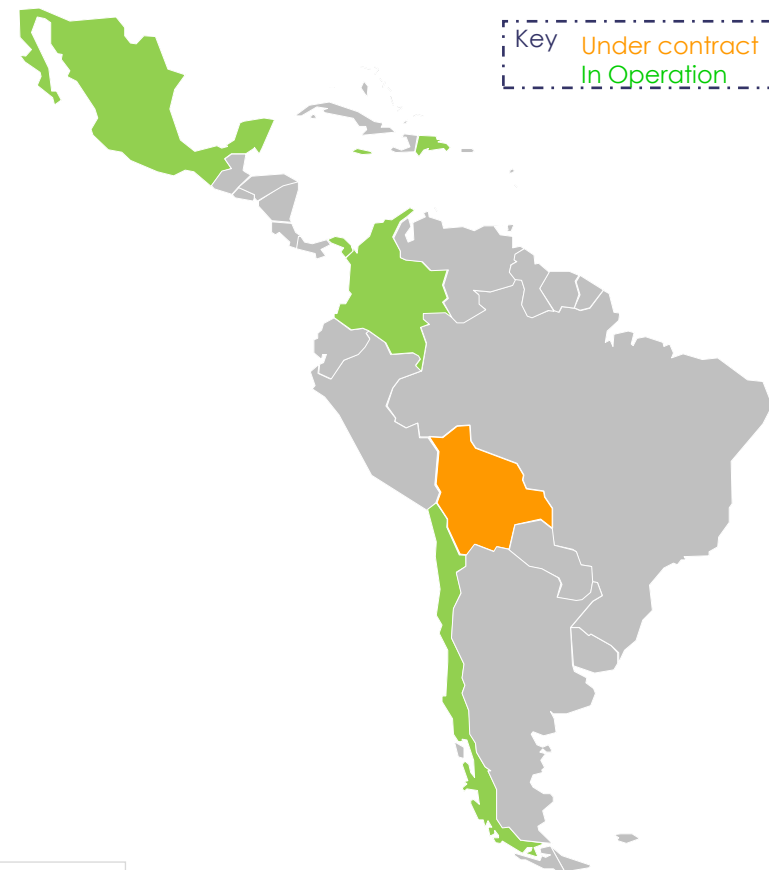
TopSky – ATC Deployment in the CAR/SAM Region (cont.)

Aruba

- Initially installed in 2012 (FDP only)
- FPL2012 compliant
- Installed AHMS & WAM in 2016
- Next upgrade Aug 2018

Bolivia

- Installation at La Paz completed Mar 2018
- Installations on-going:
 - Santa Cruz
 - Cochabamba
 - Trinidad
 - Cegata



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TopSky – ATC Deployment in the CAR/SAM Region (cont.)

Chile

- Initially installed in 1998 at:
 - Punta Arenas
 - Puerto Montt
 - Iquique
 - Antofagasta
- Santiago and SIMCAT commissioned in 1999
- Santiago upgraded in 2009
- Proprietary OLDI (based on v2.1) – only used between sites
- Now, Thales installation only at Santiago
- Updated 2013
- FPL2012 compliant

Colombia - San Andres

- Installed in 2012



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Dominican Republic

- Las Americas 1st commissioned 1993
- Upgraded in 2003
- Punta Cana 1st commissioned 2005
- Las Americas and Punta Cana upgraded in 2014/15
- FPL2012 compliant
- Next upgrade early 2019

Jamaica

- Installed in 2017
- FPL2012 compliant
- APAC AIDC tests with:
 - Barranquilla (Indra Aircon 2100)
 - Panama (Thales)
- NAM AIDC tests with:
 - Cuba (RADCOM – in house development)
 - Cenamer (Indra Aircon 2100)



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TopSky – ATC Deployment in the CAR/SAM Region (cont.)

Mexico

- ACC initially commissioned between 1994 & 1996
- ACCs upgraded Merida, Monterey, Mazatlán and Mexico between 2004 to 2008
- APP in Acapulco, Cancun, Chihuahua, El Bajío, Guadalajara, Hermosillo, Puerto Vallarta, San Jose del Cabo, Tijuana, Toluca & Vera Cruz

Panama

- ACC at Albrook initially installed in 2013
- FPL2012 compliant
- Updated in Jul 2017 (following AIDC specific site visit in 2015)
- APAC AIDC tests with
 - Bogota (Indra Aircon 2100)
 - Barranquilla (Indra Aircon 2100)
 - Cenamer (Indra Aircon 2100)
 - Jamaica (Thales)



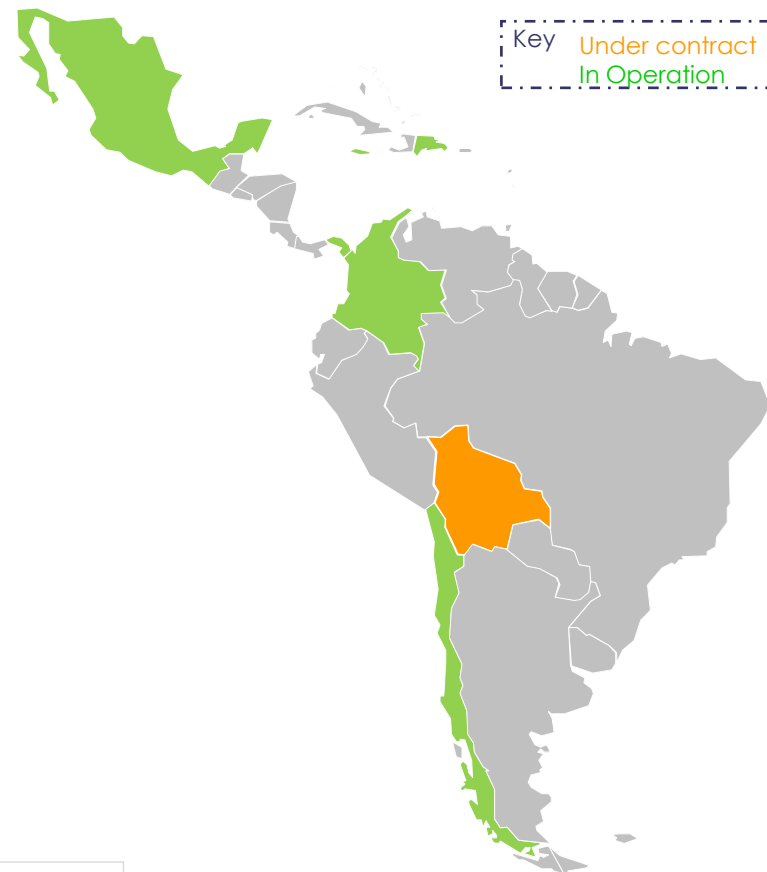
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TopSky – ATC Deployment in the CAR/SAM Region (cont.)

Sint Maarten

- Temporary system installed in Oct 2017 (FDP only)
- FPL2012 compliant
- Complete ATC system to be installed by August 2018



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AIDC specifications

- In places, the specifications are interpreted differently by different vendors
- Implementation can be different from the specification
- Thales would like to establish a closer working relationship with ICAO in the different regions

An AIDC test platform not always available

- Thales recommends AIDC testing to be performed on a test platform

Systems purchased with AIDC Implementation planned beyond system warranty/support

- Required AIDC configuration settings are not known at system purchase time
- AIDC tests with adjacent FIRs not planned (and hence not performed) during SAT whilst our engineers are on site
- Due the complexity of AIDC configuration settings, a support agreement with Thales is recommended

Thales is not always kept informed of planned AIDC trials

- If the testing is performed whilst our engineer is on-site, we can quickly investigate any issues and adjust the configuration rapidly
- If Thales is informed of intended AIDC trials, we can be ready to provide remote support
- Results of trials (success/failures) are not always reported to Thales

CDN

- “Field 22 may contain fields 14, 15 and 18”
 - If field 14 is provided, it should be stated that field 14a is mandatory
 - If field 14b is present, then field 14c must also be present

AOC

- The reference message is required to be encoded in AFTN ODF option 3, some vendors have not appreciated that APAC AIDC has adopted the use of AFTN ODF option 3 in its specification

LRM

- Inconsistency between specification and example regarding “<invalid text>”, TopSky-ATC sends the supporting text defined in Appendix B of specification, other vendors only supply the error code
- Supporting text for error code 65 includes a semicolon character, some vendors do not accept this character (because of allowed characters stated in ICAO Annex 10, Vol. II does not include semicolon) so TopSky-ATC replaces this by a comma

Adaptation data incorrectly set/updated

- Incorrect and/or inconsistent point set between FIRs and/or incorrect flight plan submission can lead to incorrect route extraction for Field 15
- New aircraft types not always added to the data set

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CPL

- A 2nd CPL message for a flight plan is accepted by TopSky-ATC according to allowed flight plan state. Some NAM users have stated that this should be LRMed but Thales's experience from users of OLDI/APAC AIDC implementations have requested this and consider it an improvement

LRM

- The erroneous text in the LRM message is specified to contain the contents of the message that caused the error when the error is field specific. There are instances when the descriptive error message would be more helpful to the ATCO

Adaptation data incorrectly set/updated

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Our future enhancements are primarily driven by:

- **ANSP's needs**, and
- **Evolving regulations and standards**

■ **Conform to updated AIDC specifications, including optional messages and support for oceanic flights**

- APAC AIDC v3
- NAM AIDC Rev E
- OLDI 4.2

■ **New AIDC Protocols**

- PAN AIDC

■ **Improved HMI**

- Including improvements to AIDC related interactions, e.g. quicker access from track labels, improved queues and search facilities, etc.

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- Through extensive in-the-field experiences around the world, Thales continues to improve its AIDC Implementation in the TopSky-ATC Product
- Thales is ready to work closer with regulators
- Thales **requires** the cooperation and feedback from ANSPs
 - Testing against in-house simulators in factory is not sufficient
- Thales is ready and willing to help you across all your AIDC Implementation phases

LET'S WORK TOGETHER

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Any Questions?

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Thank You !

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