<table>
<thead>
<tr>
<th>Page</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Europe: SITAONAIR and the evolution of datalink</td>
</tr>
<tr>
<td>4</td>
<td>Air traffic growth and ATM transformation in the Middle East</td>
</tr>
<tr>
<td>6</td>
<td>ATM perspectives in Africa</td>
</tr>
</tbody>
</table>
Dear reader – like most of you, I am convinced the next few years will see our already crowded skies fill with an unprecedented number of drones. There has been an explosion in commercial and private drone use over the past few years, and with it, reports by Air Navigation Service Providers (ANSPs) around the world of safety incidents related to incursions into their airspace.

A global approach to Unmanned Aircraft System Traffic Management (UTM) is being established to tackle this challenge, and in Europe, the Single European Sky ATM Research (SESAR) defined U-space concept is creating the conditions necessary for drones to have safe, efficient and secure access to airspace.

By enabling situational awareness for drone operators, and data exchange between drones, law enforcement, airspace managers and other stakeholders, U-space will support the burgeoning drone market. For Europe alone, this market is expected to bring economic benefits of €10 billion a year by 2035, and more than €15 billion a year by 2050.

In 2017 SITAONAIR, in collaboration with Skyguide, AirMap, senseFly and PX4, and with the support of the Swiss Federal Office of Civil Aviation, developed and exhibited the drone registry, which will play a central role in the U-space project. The blockchain-based database, managed by SITAONAIR, was successfully showcased in Europe’s first live drone demonstration of U-space capabilities, organized by Skyguide, which took place in Geneva on 14 September 2017.

Thanks to its blockchain-based design (also known as distributed ledger technology), the registry provides the security, flexibility and scalability for further international development. It is distributed across multiple locations, requiring each database transaction to be signed, encrypted and replicated across all participating ledgers, minimizing the risk of fraud occurring or data being compromised through cyber attack.

This indisputable source of up-to-date registry information also reduces the chance of dispute, and creates a stronger base for auditing, insurance claims, proof of good behavior, or any fines and prosecutions for bad behavior.

As part of the SITA Group, the world’s leading specialist in air transport communications and information technology, SITAONAIR has been selected as the ideal manager for this international drone registry, providing a rich IT portfolio for the air transport industry. The SITA Group is a membership-owned organisation with more than 400 active members from across the air transport community, including airlines, airports, airport-based organizations and air traffic management.

Together with the Irish Government, the SITA Group jointly owns Aviareto, the organization responsible for managing the International Registry of Aircraft Assets under the guidance of, and mandate from, the International Civil Aviation Organization (ICAO). This registry defines the priority of interests on airframes, aircraft engines and helicopters globally.

As the skies become ever more crowded, SITONAIR will continue supporting ANSPs and the Air Transport Industry (ATI) community, in enabling the safe and efficient integration of drones into airspaces worldwide.

Should you wish to further discuss the subject, come and see us at the CANSO World ATM Congress, Stand 473, Hall 10!

Yours sincerely

François Bardin
Director – Air Traffic Solutions
Global Highlights

Europe: SITAONAIR and the evolution of datalink

It feels like a long time has passed since the European datalink service was first launched on a single frequency back in the early 2000s, and since those early days, there has been a rapid acceleration in the pace of datalink implementation in Europe.

The last two years have seen a series of major developments in the evolution of European datalink, to meet both the February 2018 mandate deadline and the SESAR Deployment Manager (SDM) launched Connecting Europe Facility (CEF) 2016 projects, developed as part of the recovery plan for datalink.

Due to traffic increasing more quickly than expected (European ATM currently handles around 26,000 flights daily), the performance of datalink started to decline after the initial launch. Interferences limited the capacity of the channel and put the Provider Abort (PA) issue front and center in everybody's minds, making it clear that a quick fix was needed.

Following an investigation, the European Aviation Safety Agency (EASA) recommended an expedited implementation of VDLm2 multi-frequency. The SESAR Joint Undertaking (SJU) conducted the ELSA study with a large industrial consortium, including SITAONAIR, to determine where and how multi-frequency needed to be implemented.

Then came the involvement of SDM, which was nominated as Datalink Program Manager by the European Commission at the end of 2016. SDM launched CEF 2016 projects with two main objectives:

1) The short-term implementation of VDLm2 multi-frequency according to Model B or Model C/MF, possibly by the February 2018 deadline.

2) Investigate the longer-term implementation of Model D.

Timings for the CEF 2016 projects were ambitious. Having already worked on implementing multi-frequency, SITAONAIR was a key contributor in getting the project right. Huge efforts were made to implement MF-Model B in the parts of Europe with the highest density air traffic.

In less than 18 months, SITAONAIR successfully validated and deployed a VDLm2 MF infrastructure in France, Benelux, Germany, England, Switzerland, Portugal and Spain airspaces. It also signed additional ATN/VDLm2 service contracts with most of the Baltic and Balkan countries.

SITAONAIR was also instrumental in developing a Central Frequency Management System (CVME), which plays a crucial role in the efficient tuning of aircraft to the additional VDLm2 frequencies. Today, SITAONAIR tunes an average 2,000 aircraft every day on VDLm2 frequencies other than the Common Signaling Channel (CSC).

The impact has been direct and impressive. The PA rate in the Eurocontrol airspace managed by the Maastricht Upper Airspace Center (MUAC) has dropped to only 2%, down from peaks of 20-25% in 2014. Deutsche Flugsicherung (DFS), Skyguide and NATS reported similar performance gains.

The successful implementation of multi-frequency Model B addressed the performance issues, at least where performance degradation was associated with VHF infrastructure.

SITAONAIR is determined to pursue the deployment of multi-frequency in Europe, and active discussions are underway with Air Navigation Service Providers (ANSP) to this end. SITAONAIR is also determined to support the SDM and the European ANSPs with its successful implementation of an efficient and high-performing VHF infrastructure. This will help operators reach the European Commission’s Controller-Pilot DataLink Communications (CPDLC) mandate, as well as any new requirements arising from SJU’s Pilot Common Project (PCP).
The Middle East air traffic industry, which represents 9.6% of the global market share, increased its traffic volume by 5.5% in 2017 and, according to IATA forecasts, will continue to grow by 5% annually for the next 20 years.

This growth stems not only from an increase in local traffic, but also the strengthening of regional hubs, including Dubai, Abu Dhabi and Doha. While excellent news for the region, this growth does not come without challenges, particularly for Communication, Navigation and Surveillance (CNS). SITAONAIR is a key player in the regional transformation project necessary to deal with increasing demand, providing key airport tower systems and datalink services.

To cope with the growth, many regional initiatives are budgeting for huge investment in Air Traffic Management (ATM) systems and the building of new Air Traffic Control (ATC) centers with state-of-the-art ATM Systems. However, the region’s political climate means that there are more restrictions on ATC evolution than elsewhere in the world.

The mission of ANSPs in the region is to alleviate traffic growth and deliver significant benefits through major transformations in safety and performance.

This strategy requires the implementation of a range of new ATM technology, including Datalink Services, CPDLC, space-based ADS-B, Collaborative Decision Making (CDM) and Performance-based Navigation (PBN).

With the aim of developing one of the most advanced ATM systems in the world, December 2017 saw the General Civil Aviation Authority of the United Arab Emirates embark on a major transformation of airspace management.

The transformation indicated the completion of the UAE’s Airspace Restructuring Project. In progress for years, the project involved coordination and cooperation between aviation stakeholders in Saudi Arabia, Oman, Qatar, Bahrain and Iran. A major objective of the project has been to transform the UAE Flight Information Region (FIR) to become the first airspace in the world to be entirely based on PBN.
Global Highlights

Continued development for SATCOM-based surveillance

Aireon was created as a 2012 joint-venture between Iridium Communications and a number of ANSPs: NAV CANADA initially, followed by Italy’s ENAV, the Irish Aviation Authority (IAA) and Denmark’s Naviair. The objective was to place ADS-B receivers on the Iridium NEXT constellation, which commenced with an initial Space X launch in January 2017, and is set to continue throughout 2018. The constellation currently consists of 66 Low Earth Orbit (LEO) operating satellites, which will rise to a full constellation of 81 satellites once complete.

This game-changing technology will revolutionize the surveillance segment of ATC, providing full surveillance capability over oceanic, polar and remote airspace. In addition, it will deliver a more efficient and flexible use of airspace, and enhanced safety and fuel efficiency capabilities for airlines. Space-based ADS-B can also be used to complement existing surveillance systems over continental airspace (where available), allowing ANSPs to optimize surveillance infrastructure and operating costs.

The impetus for Aireon’s creation and the Iridium NEXT project came partially from shortcomings in Automatic Dependent Surveillance (ADS) technology. Among the various surveillance technologies currently used by ATC, ADS, in contrast to radar and multilateration (MLAT), relies on a position transmitted by the aircraft. ADS-C (Contract) allows an aircraft to send its position via a satellite datalink, according to a ground-based initiated contract. The ADS-B (Broadcast), meanwhile, embeds position within the second-by-second squitter pulses, sent on the 1090 MHz frequency by the aircraft’s transponder. Traditionally, these squitters are then captured by ground antennas and relayed to the surveillance-tracking system, which forms the flight path presented on the Air Traffic Controller screen.

The limitation of ADS-B technology in its usual form is that it can only be made available in areas where ground antennas can be deployed, which effectively rules out remote airspaces such as oceans, deserts or poles. Where deployed, these terrestrial surveillance systems are also limited to line-of-sight. In order to address these shortcomings, Aireon and the Iridium NEXT project was established to capture ADS-B squitters from a satellite constellation, before relaying to a ground-based tracker.

While space-based ADS-B and ADS-C could initially appear to be competing surveillance solutions, they are actually very complementary. ADS-B squitter pulses provide real-time aircraft positioning, whereas ADS-C enables the ATC to request extended flight-route information and EPP (Extended Project Profile). ADS-C will also provide event reports, alerting on waypoint changes, level range changes, vertical-rate changes or lateral deviation. Importantly, the ADS-C function is usually combined with CPDLC, which provides the essential communication channel for the controller to transmit instructions and clearances to the pilot.

As a Communication Service Provider (CSP), SITAONAIR already delivers both ADS-C and CPDLC data to ANSPs. The communication links already used to deliver these to ATC systems could be employed to convey ADS-B data in a similarly quick and easy fashion.

The combined use of ground and space-based ADS-B and ADS-C surveillance data, alongside CPDLC capability, will deliver the efficient surveillance and communication systems required to meet future capacity requirements and enhance safety in compliance with the ICAO’s Aviation Systems Block Upgrades (ASBU).
Global Highlights

ATM perspectives in Africa

Connecting markets and encouraging tourism, air transport holds one of the major keys to economic growth on the African continent. At present, Africa’s air transport industry is still relatively immature, representing just 2.2% of the global air transport market. However, with a rapidly expanding population, there is enormous potential for growth.

African air traffic grew by 9% in 2017 alone, and the IATA forecasts annual growth rates of 6% for the next decade. The pace of growth in 2017 saw regional ANSPs manage more than a million flights over the course of the year.

The immaturity of the continent’s air transport industry, combined with its sheer diversity of characteristics, presents substantial challenges for air navigation services, aviation safety and the management of technical and operational changes.

Some African countries lag behind in terms of ANS infrastructure, and the ICAO has acknowledged that investment is needed to modernize and expand air navigation facilities and services. At this stage, the investment required may still be beyond the financial capabilities of some states.

Regardless of investment success, African aviation will only reach its potential with strong partnerships between regional ANSPs. The signs for cooperation are positive, and the end of 2017 saw a memorandum of understanding signed between ASECNA (responsible for providing ANS to 17 countries in Africa) and ATNS (responsible for South Africa), paving the way for cooperation in African airspace management.

SITAONAIR has a close relationship with most African ANSPs, demonstrated over the course of the year by SITAONAIR’s work on an IP gateway project using ASECNA’s Satellite Network. In total, three gateway projects were set up and connected to SITAONAIR AIRCOM datalink network over the course of the year (Fuchsstadt, Dakar and Abidjan). The configuration will route data from the gateway to the ATM systems of ASECNA member states.
Regional Highlights

Europe

SITAONAIR contracted to establish ATN/VDLm2 services in Estonia and Latvia
Estonian ANSP EANS and LGS of Latvia, have contracted SITAONAIR to provide Aeronautical Telecommunication Network / VHF Data Link Mode 2 (ATN/VDLm2) services in their respective airspace. The contract includes deployment of multi-frequency where and when air traffic levels justify it.

In both cases, service was established in less than four months, making it possible for these Air Navigation Service Providers (ANSPs) to make progress in meeting the deadline set by the Regulation on Datalink Services.

SITAONAIR and Thales partner on DLFEP/ATN B2 development
Eurocontrol’s Maastricht Upper Airspace Center (MUAC) is taking steps to support the ATN B2 generation of Air/Ground datalink applications. MUAC is already using the Datalink Front End Processor (DLFEP) product, jointly owned by SITAONAIR and Thales, who have now been contracted to develop the ATN B2 version of the DLFEP.

SITAONAIR contracted to rollout VDLm2 multi-frequency in Germany, Portugal and Spain
In the context of the CEF 2016 implementation projects, launched by the SESAR Deployment Manager (SDM), the ANSPs of Germany (DFS), Portugal (NAV Portugal) and Spain (ENAIRE) contracted SITAONAIR to deploy the multi-frequency version of VDLm2 infrastructure. SITAONAIR is responsible for installing and validating the upgrade to MF, and to perform the management of the frequencies from its Central VHF Management Entity (CVME).

Successful acceptance of DLFEP/ATN VDLm2 service in Poland
SITAONAIR successfully conducted the acceptance of its DLFEP system with the Polish Air Navigation Services Agency (PANSA), as well as the country’s ATN/VDLm2 service. The comprehensive acceptance tests focused on both the detailed validation of the DLFEP and the end-to-end testing with aircraft.
Africa – Middle East

SITAONAIR selected to provide FANS service to Mozambique
Early in 2017, DF Nucleo, a provider of turnkey solutions for the aeronautical industry, selected SITAONAIR to provide FANS-1/A to Aeroportos de Moçambique (ADM). The deal followed SITAONAIR’s earlier work on the delivery of Controller–Pilot Data Link Communications (CPDLC) and Automatic Dependent Surveillance - Contract (ADS-C) for ADM. SITAONAIR provided the datalink connectivity and managed FANS-1/A services at Beira Airport in Mozambique.

Bahrain CAA, UAE ADAC and ENANA Angola renew contracts with SITAONAIR for FANS and pre-FANS services
Reaffirming their confidence in SITAONAIR, 2017 saw Bahrain Civil Aviation Authority (BCAA), Abu Dhabi Airport Company (ADAC) and ENANA Angola renew their contracts for FANS & pre-FANS Datalink services with SITAONAIR.

These renewals enabled ANSPs to continue receiving CPDLC/ADS-C, D-ATIS and Datalink Departure Clearance (DCL) services, reinforcing SITAONAIR’s position as the leading provider for datalink communication in the Middle East and Africa.

SITAONAIR contracted to provide D-ATIS for airbases in Saudi Arabia
June 2017 saw Thales Air Systems contract SITAONAIR for the provision of AIRCOMevatis COTS ATIS solutions for two airbases in Saudi Arabia. The project has successfully progressed as planned, with a successful Critical Design Review in September 2017 and successful Factory Acceptance Tests in January 2018.

Onsite installation, to take place in tandem with Thales and the final end-user, is scheduled over the course of 2018 or early 2019. These systems will provide automation, speed and additional accuracy in the handling of weather and airport operational information.

Regional events and conferences
As a CANSO member, SITAONAIR was present at the CANSO Africa Conference 2017 in Marrakech, hosted by the Moroccan Airport Authority. Focusing primarily on technology and human performance in ATM, the event was well attended by a large number of ANSPs and industry stakeholders, who discussed the diverse challenges and latest safety improvements in African airspace.

A series of safety workshops followed the conference, covering awareness of conventional safety issues in Africa and helpful tips for enhancing performance.
SITAONAIR provides FANS 1/A Datalink to new Air Traffic Management Center in Manila

SITAONAIR and the Civil Aviation Authority of the Philippines have reached an agreement to provide SITAONAIR FANS 1/A Datalink services to the Air Traffic Management system at the new Manila ACC Center.

The service will allow ATC controllers to process ADS-C/CPDLC messages, reducing traditional voice communication loads by facilitating air-ground communication via ACARS messages.

SITAONAIR had been providing datalink services to the Philippines from its previous ATM center. The latest agreement will see SITAONAIR monitor the transition process, assuring a safe and solid datalink message delivery in both new and existing ATM Centers.

SITAONAIR participates in the ICAO Asia Pacific FANS Interoperability (FIT) annual team group

SITAONAIR participated in the sixth and seventh FANS Interoperability Subgroups (FIT), held at the ICAO regional office in Bangkok during August and December. Attendees shared the progress of Asia Pacific FANS processing, reporting to the central agency and their experience of their extensive ADS-C / CPDLC usage, both continental and oceanic.

These ICAO FIT subgroup meetings provide the opportunity for ANSPs to work together to meet ICAO requirements set out in the Performance Based Communication Surveillance Mandate (PBCS).

D-ATIS system upgrade for CAAS in Singapore

SITAONAIR, in partnership with Singapore Technologies (ST Infosoft), has signed a new contract to provide an upgrade of the existing SITAONAIR D-ATIS system in Singapore to the Civil Aviation Authority of Singapore (CAAS).

The system upgrade will provide the capability to process and broadcast Aeronautical Terminal and Meteo information, granting new capabilities to process and manage multiple runways at Singapore’s Changi International Airport, which with 58 million passengers, was the world’s sixth busiest in 2017.

The SITAONAIR D-ATIS system can process ATIS information and broadcast to airlines using VHF radios (automatic synthetic voice) and directly through the datalink service (using pre-FANS protocol). This datalink service allows all necessary information to be sent via text from the SITAONAIR D-ATIS system to the pilot FMS in the cockpit via ACARS, reducing the chances of language misunderstandings and removing the need for repetition.

SITAONAIR and Japanese Civil Aviation Bureau cooperation

A delegation from the Japanese Civil Aviation Bureau (JCAB) visited SITAONAIR’s Paris office in December, looking to discuss the cases of VDL and multi-frequency that SITAONAIR is driving in Europe as part of the SESAR project.

Prior to the visit, SITAONAIR participated in the Japan Datalink Forum 2017, which attracted over 100 aerospace industry representatives to Tokyo in August. SITAONAIR was honored to exhibit the latest datalink initiatives in Europe and the USA, alongside datalink-based tracking for airlines around the world.

SITAONAIR is one of the main providers of datalink services in Japan, providing FANS 1/A datalink services to ensure safe communication between ground controllers and pilots.
Latin America and Caribbean

**SITAONAIR and DECEA work together to expand ATS datalink services in Brazil**
Late 2017 saw SITAONAIR and DECEA expand ATS datalink services for airports in Rio de Janeiro and São Paulo. This built on a 2014 agreement to equip an initial 24 airports in Brazil with automated D-ATIS / DCL / D-VOLMET solutions.

Rio de Janeiro’s Santos Dumont and São Paulo’s Campinas Airport are to be equipped with Datalink and Voice ATIS (D-ATIS) and DCL, bringing the total number of control towers equipped with SITAONAIR ATC systems to 26.

**SITAONAIR contracted to provide FANS service in Argentina**
ICAO Technical Cooperation Bureau, working on behalf of Argentina’s ANSP Empresa Argentina de Navegación Aérea (EANA) has renewed its contract with SITAONAIR for the provision of ATS Datalink services to support FANS (ADS-C and CPDLC) for the Buenos Aires and Comodoro Rivadavia ACC. The service allows for a complete digitization of the controller-pilot dialogue over Flight Information Regions not usually served by VHF, improving safety and the accuracy of data, and reducing controller and pilot workloads.

**CANSO Latin America and Caribbean Conference**
SITAONAIR sponsored and participated in the CANSO Latin America and Caribbean Conference, held in Salvador, Brazil, in December. Hosted by the Brazilian Department of Airspace Control (DECEA), the event attracted 100+ delegates from more than 20 countries. Guests, including major Central and South American ANSPs and representatives from organizations like IATA and ALTA, discussed operational and safety considerations of continued growth in the region, data sharing and air traffic flow management.

François Bardin, Director – Air Traffic Solutions, presented SITAONAIR’s perspectives on the challenges faced during the implementation of Aviation System Block Upgrade (ASBU).
**USA and Canada**

**SITAONAIR offering continued support to Harris for delivery of FAA’s Data Comm**

SITAONAIR continues to expand the VHF Digital Link (VDL) service in the US, partnering with Harris as the data comm program integrator for airlines and air traffic control agencies. SITAONAIR has increased current VDL coverage and developed improved redundancy design that enables more coverage and reduces potential service interruption. To prepare for an oversaturation of channel bandwidth, VDL capacity is also being addressed through SITAONAIR’s work to expand both VDL common signal channels and multi-frequency VDL.

In addition to existing VDL coverage, SITAONAIR also deployed VDL to 57 of the 65 US airports the FAA will use to support CPDLC FANS 1/A messages for airport operations, departure clearances and amendments to clearances.

SITAONAIR has also deployed VDL en-route service coverage in the US to another 24 sites, set to rise to a total of 119 development sites by Q1 2019. These en-route sites are planned to support the FAA airspace control sector activation dates, which are intended to support en-route CPDLC messaging from Q3 2018.

In the US, airlines are increasingly equipping VDL to participate in the FAA CPDLC program, and we expect to see increased VDL activity for ATC as well as AOC messaging. With increased VDL upgrades to legacy fleets and new aircraft being delivered with both VDL and VHF Datalink, VDL capacity needs to be assessed. SITAONAIR currently has seven sites that are capable of multi-frequency VDL, with another 60 sites planned by the end of the year. Trials of multi-frequency VDL will begin on select sites in Q2 2018, with full operational capability by the end of 2018.

To ensure service is maintained, SITAONAIR is deploying a new redundant site design built on duplicated radios, routers, connectivity and uninterrupted power sources. These sites will have the capability to reestablish VDL service in 30 seconds or less if any of the primary components fail.
SITAONAIR at a glance

SITAONAIR is the air travel industry’s trusted connected aircraft service expert, powering innovation with recognized expertise and future-proof solutions. With our unrivalled industry-backed heritage, SITAONAIR delivers the promises of the connected aircraft, empowering 400+ airlines and 16,000+ aircraft to navigate the complexity of connectivity with our best-in-class solutions and services for passengers, cockpit and cabin crew, flight operations, aircraft big data and air traffic management. We believe that embracing a digital shift will reinvent the operation of aircraft, flight and on-board experience – making it safer, more efficient and enjoyable.

SITAONAIR is a subsidiary of The SITA Group, the communications and IT solution provider that transforms air travel through technology for airlines, at airports and on aircraft.

SITAONAIR around the world


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