ANA
Administration de la navigation aérienne

ANNUAL REPORT 2019

Positive developments in air traffic services

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FOREWORD

2019 Achievements for ANA, the Luxembourg Air Navigation Administration ("Administration de la Navigation Aérienne").

As the Director of ANA, I have the pleasure to work with a dedicated team that takes up the challenges and makes it all happen. The present report addresses the major steps taken and achievements reached:

- Update and installation of the surveillance system and other modern technical infrastructures,
- Development of performance based navigation procedures,
- Technical and operational cooperation with our partner skeyes as well as other ATM partners for mutual benefit,
- Development of a dedicated environment management system meeting high standards,
- Recertification of our AIS as the AIS service provider for Luxembourg,
- Development and agreement of IRICE[1] – a new ambition and value initiative and program for our personnel, our partners in aviation, and for our management and service structure

ANA is proud to have reinforced its work programs with improved project and financial management. ANA is ready and is going to meet the upcoming next generation of CNS ATM systems as required by the ATM Masterplan and SESAR with confidence.

ANA delivered a safe and efficient service and managed another year of growing demand in terms of traffic and implementing vital equipment and procedures.

In 2019, ANA saw additional important developments and changes:

- Further growth of traffic movements,
- Further alignment of the organizational structure, management and processes,
- Increased compliance with national and European regulations in addition to standards in all performance areas,
- Improved results in safety and environment,
- Increased competence and motivation in all areas.

We are about to experience it in 2020: Continuous development and positive growth cannot be taken for granted. For aviation at large, the entire closely integrated service and production chain is especially vulnerable to interruption and crisis. Pulling up the tools, supporting our partners, providing reliable and good services as much as we can is our task and commitment. It is the extra step that we, the people in ANA take and will continue to take in the future.

Claudio Clori
ANA Director

[1] IRICE – Integrity, Respect, Innovation, Commitment and Excellence

FACTS & FIGURES

Throughout the Reporting Period (RP2), traffic remained constant, and service units steadily increased. Except for freight, which slightly decreased, 2019 figures represented new records for ANA and Luxembourg airport.

MOVEMENTS, PASSENGERS, FREIGHT & SERVICE UNITS

	2015	2016	2017	2018	2019	Change 2018-19
Total movements	85. 031	86. 402	89. 944	94. 586	94. 985	+ 0, 4 %
International Movements	65. 128	69. 577	74. 515	79. 109	80. 557	+ 2 %
Passengers (Mio)	2, 687	3, 022	3, 599	4, 037	4, 416	+ 9 %
Freight (t)	737. 625	801. 807	897. 127	894. 649	853. 354	-5 %
Actual terminal Service Units (SU) (in .000)	41, 1	45, 7	50, 9	54, 4	56, 0	+ 3 %
SU Forecast in Performance Plan (in .000)	41, 3	43, 0	44, 7	46, 9	49, 0	+ 4, 6 %

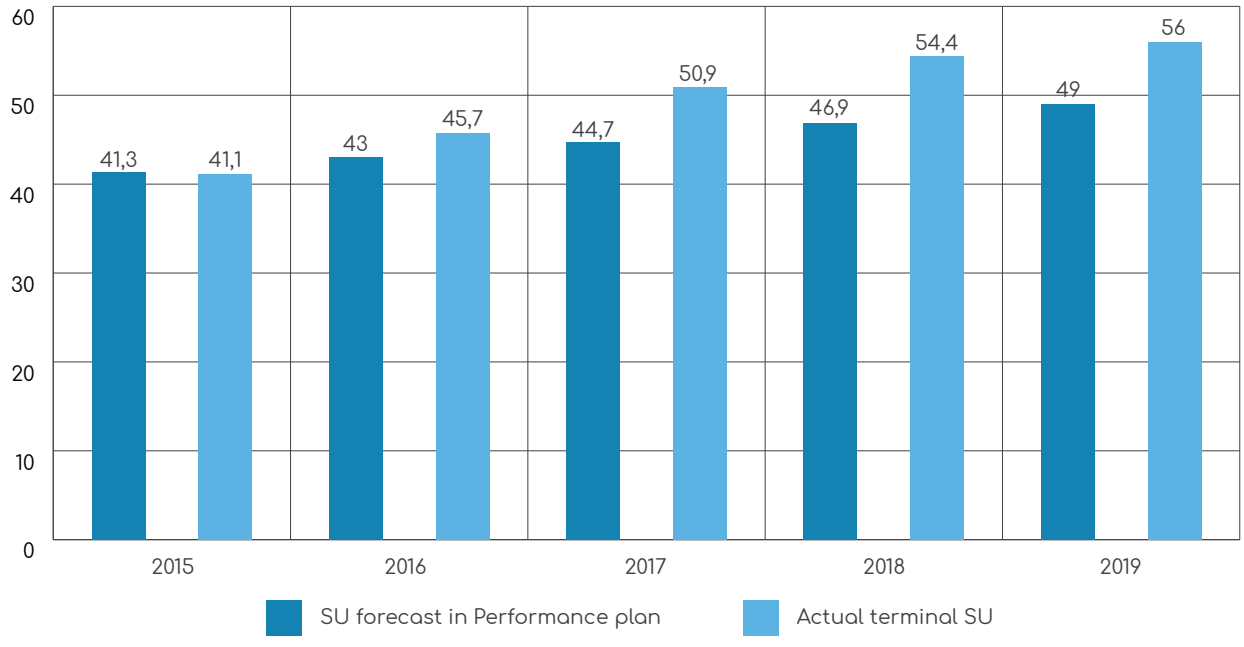
2019 RESULTS

ANA, in its mission of efficient ANSP actively supported Luxembourg airport. The observed trend in Luxembourg airport activities continued in line with trends reported by other airports.

These are the 2019 observations: Bigger increase in passenger numbers – around 9% in 2019 in Luxembourg – but a smaller increase in traffic movements (Mvmt) (2%) by using larger aircraft (as indicated by a further increase in service units) and probably achieving a better load factor on average.

The number of (terminal) service units increased by 3% from 2018 to 2019.

The actual service units are 14,2% higher than the forecast for 2019 in the Performance Plan.



DEVELOPMENT HIGHLIGHTS IN 2019

ANA continued implementing changes and developing its aeronautical and Air Navigation Services (ANS). ANA strived hard to offer modern, highly reliable Communication, Navigation and Surveillance (CNS) equipment as well as aerodrome infrastructure. This has strengthened our customers' marketplace position.

Safe, effective and efficient technology maintained by competent staff is a core factor for the continuity of service.

CNS technical services continued installing and renewing ANA technical infrastructure in all domains, from network infrastructure, virtualized servers, and radar sensors, to navigation equipment for a safe, well performing and efficient technical environment.

One of the major steps was the finalization and commissionning of a complete updated radar surveillance (SUR) system – from radar head, data processing, and dissemination down to brand new modern HMI's on Controller Working Positions (CWP), all the functionalities were greatly improved.

The new surveillance system in place is fully interoperable. It also interlinks with and contributes to the common radar network, and is capable to provide improved safety features.

Radar data exchange has been done since 2019 via the new SUR data distribution system SDDS, adding ANA radar data to the common radar network.

Competence is the key to using modern tools and functions to best effect:

Air Traffic Controllers, Technicians in every CNS domains, as well as Meteorology (MET) and AIS Aeronautical experts are fully trained to operate the whole set of ANA interconnected systems and use the functionalities available to best effect.

They are supported by a team of experts in Safety and Security, Human Resources, Management, Finance, IT, Project Management, and Administration.

Strategic lead, good management practices, effective processes and structures are in place. Their continuous development is a relentless task: Monitoring and measuring our performance and how best to achieve our goals is common to all of us in ANA.

2019 was the first full year of our ambition and value program IRICE – for our personnel, our partners in aviation, and our management and service structure. The IRICE mission to deliver a high quality of service, to be a center of expertise and competence on all questions regarding ANS safety and quality, as well as to further develop our capabilities as a major economic actor in Luxembourg aviation took off in 2019. Our personnel is recognized to be highly motivated, to collaborate smoothly with our partners and to always endorse responsibility on our activities and services. Our personnel is supported by a coherent vision, mission and strategy in management, which is facilitated by transparent processes and structures.

The calendar of events highlights some important developments in 2019.

CALENDAR OF EVENTS 2019

The year 2019 saw the following projects and activities finalized:

Months	2019
01	• Full start of ANAs IRICE program - Integrity, Respect, Innovation, Commitment & Excellence An initiative and program for our partners, for our personnel and for the structure in which we operate • MET Lightning detector in service
02	• AIS recertified as sole Luxembourg AISP
03	• eTOD data for the entire country and the aerodrome is available; start of the installation of an efficient software for handling data
04	• Implementation of GDPR – protection of personal data and info
05	• Completion of new run-up area feasibility study • Implementation of new designed southern circuit for VFR - easier to fly & avoid flying too close to IFR on RWY 06
06	• Updated Surveillance system is officially commissionnned with some initial restrictions • ANA & skeyes cooperation agreement on CDO performance monitoring and statistics • Replacement of the obsolete SUR recording system
07	• SDDS radar data exchange system between adjacent centers • ANA aerodrome driver simulator to cover training to be delivered to all permit B drivers • Back-up server building as contingency location for technical equipment • The new process and management structure for strategical project and change management comes into force
08	• eTOD software installation completed • Station South - new power station for independent main power supply • New ATM network for increased redundancy, flexibility and network monitoring • ATM virtual server architecture
09	• Agreement with satellite provider ESSP for the installation of PBN at Luxembourg airport • ANA receives the EGNOS price in Rome
10	• Installation of new network infrastructure and topology in all CNS operated stations • Replacement of MET Ceilometer
11	• ANA receives the EPSA 2019 Best Practice award for its environmental activities • ANA and skeyes sign a new SLA for AIM provision of AIPs aiming for higher data quality in line with EU Regulation • TAR2 radar upgrade with new enhanced Mode S sensor • ADQ workshop between ANA, DAC and Eurocontrol
12	• New data center for technical infrastructure installations CNS and ELE is operational • ILS06 radio NAV and DME for all weather (Cat I) precision approach • Implementation of conventional approach procedures based on VOR-DME for RWY 24 and 06

In 2019, ANA continued adjusting internal management structures in line with new requirements. This included putting in place a dedicated Environment Management System (EMS) with adequate resources (see Chapter on ENVIRONMENT, page 18).

The recertification of our AIS service in February as AIS for Luxembourg was an important step forward of AIS as the sole provider of aeronautical information in Luxembourg. The preparation for a certification process continued after the event and led to a clear understanding, plan and start of actions to meet the high data quality requirements of European legislation and international standards.

EFFORT & PERFORMANCE

Our activities and efforts are driven by our strategy:

> Being a reliable and high performing service provider, which strengthens the competitiveness within the boundaries of our ANSP as well as within the wider FABEC environment. ANA always achieves to be fully compliant with the Performance and Charging Regulation (EU Regulation 390 and 391 of 2013) for RP2.

The five topics below are our Key Performance Areas and are at the core of ANA focus.

> Safety always comes first – positive results in all Areas.
>
> Airport and airspace Capacity - Arrival ATFM delay target was not reached as restrictions were imposed as part of the introduction of a new surveillance system. All other targets were met.
>
> Cost-Efficiency - Costs increased due to personnel costs (hiring and training), and costs of finished projects, growing quicker than revenues from air traffic.
>
> Environment efforts and achievements – the efforts and activities invested in the past have paid off.
>
> Security – the measures in the ANS system demonstrate that system security has increased.

Overall, the concerted local, service specific performance indicators and related actions as well as ANA´s ambitious performance targets and Integrated Management System (IMS) lead to these results and supports all improvement actions for next year.

The table below gives the major results in performance indicators and targets in the FABEC and Local Performance Plans for 2019, the last year of RP2.

KPA	Performance Indicator	Targets	2019 Results
Safety	Effectiveness of Safety Management	Level D in all MO´s	Achieved (82,2%)
	Severity of occurrences	No Class A+B	Achieved
	Separation infringements	No Class A+B	Achieved
	ATC ground incidences	No Class A+B	Achieved (Class C = 5)
	ATM SE incidents	No Class AA+A+B	Achieved (Class C = 14)
	Just Culture implemented	All ANSP actions implemented (22 of 24)	Achieved
Capacity	ATFM arrival delay	0,20 min/flight	Not achieved (1,0 min)
	Slot adherence	> 80%	Achieved (86,2%)
	Additional taxi-out time	No target set (min/flight)	2,34 min/flight
	ATFM pre-departure delay	No target set (min/flight)	0,07 min/flight
	CRSTMP[2] delay	No target set for RP2	0 min /flight
Cost - Efficiency	Cost-efficiency (terminal ANS)	Reduce Determined Unit Cost for terminal services (DUC) (in real terms)	Not achieved – costs increased by 3,1% from 2018 to 2019
	Cost-efficiency (En-route ANS)	Reduce DUC for En-route services (in real terms)	Not achieved – costs increased by 3,7% from 2018 to 2019
Environment	Vertical flight efficiency	Implementing CDOs	All CDO´s implemented
		CDO Usage	81% of incoming flights
	Night flights	Reduce flights between 2300-0600	- 7% from 2018 to 2019
Security	ANS security	ANS Security Management	Ensured
		Access control system	Improved
	Cyber-security	Initial Test	Passed

[2] CRSTMP stands for: Capacity, Routing, Staffing, Technical ATC equipment, Airspace Management, Special events (weather excluded).

Notes:

All performance areas as per service or department are subject to review during annual management review meetings. This helps to identify areas for further improvements, setting or revising targets, and deciding on adjusting actions accordingly.

ANS SAFETY

ANA's Certification (CERT) Department is responsible for Safety Management. This includes managing and monitoring safety issues, managing occupational "health and safety" at ANA to continuously improve our ANSP safety.

Regular Safety Committee meetings between safety management structures are in place in ATC, CNS, MET, and ELE. Structures and processes in place ensure close contact, timely reaction and information exchange in order to efficiently manage safety and quality issues.

The Effectiveness of the Safety Management System (EoSMS) in the five Management Objectives has further increased and is now in line with FABEC targets.

Scale	Management Objective	FABEC Target	2018 Results	2019 Results
01	Policy & objectives	75%	63%	75%
02	Safety Risk Management	75%	75%	75%
03	Safety assurance	75%	75%	75%
04	Safety promotion	75%	75%	75%
05	Just Culture	50%	75%	75%

SAFETY ON THE GROUND IN ATC & ATM

No serious (Class A or B) safety-relevant ground-based incident happened in 2019 in ATC or in the safety critical technical areas. Issues in the past of potentially confusing airspace or navigation waypoints were identified and resolved in 2019.

The figure below shows the trend since 2011 up to and including 2019 on ATM Ground contribution to ATM incidents´.

ATM Ground contribution to ATM incidents

A similar pattern can be observed in the ATM Ground contribution of specific (technical) events (ATM SE):

- In 2019, ANA had no Class AA, no Class A and no Class B occurrences. A total of 14 Class C and a substantial amount of Class E incidents due to outages of equipment were observed.

Note: The analysis to identify the causes and deriving countermeasures is ongoing.

- During 2019, seven RWY incursions with aircraft and a total of five TWY incursions (two with aircraft) were recorded.

Note: In 2019, ANA AER started to successfully train airport and airline ground staff in English language phraseology. AER also started providing airport driver and inspection training as a measure to improve ground safety.

MANAGING RISKS IN SAFETY AREAS

ANA's mission is to perform and provide its ANS effectively and efficiently as well as to limit the risks of accidents and serious incidents.

This mission has priority above any ANA other business or economic demands.

ANA operates a proactive safety management system that aims to identify safety risks early and to limit, mitigate, or avoid these risks. All means and measures are documented and are regularly updated.

With every change in the ANS system, ANA studies the potential for related risks and develops appropriate actions against those risks and documents the outcome in compliance with regulatory requirements.

The safety level and the means in place at ANA are subject to internal and external audits.

Safety surveys and audits are also performed in the frame of FABEC and the ANSP partner organizations in FABEC through the International Audit Cooperation Team (IntACT).

Risk Management Framework for ANA as an organization has further evolved and integrated in ANA's management system.

CAPACITY

ANA is the local ATFM provider in Luxembourg in accordance with EU Regulation 255/2010 for planning, coordination and execution of ATFM measures concerning airport and terminal airspace capacity with local parties and the central ATFM unit.

ANA's mission regarding Safety takes priority to Capacity. This was demonstrated in 2019 with the necessary update of the surveillance chain. In order to perform a safe transition and human adaptation to the new system, Capacity was willingly decreased in accordance with stakeholders during the agreed transition period of the updated surveillance chain. Even though the Capactity KPA was not 100% fulfilled, ANA did the necessary for the Capacity impact to be as low as possible:

The low national target of 0,2 min/flight on arrival ATFM delay was not met in 2019. The lack of adherence is due to capacity restrictions coordinated with stakeholders during the update of the surveillance chain in order to maintain safety at its highest and indisputable level.

However, ATC related pre-departure delays were negligible with 0,01min/flight airport delays in 2019.

The additional taxi-out time of 2,34 min/flight was mostly affected by weather.

The average additional time in terminal airspace (ASMA) was at only 0,50 min in 2019.

On average, more than 86% of the slots available were met in time. Luxembourg airport is class 2 and airport slots are facilitated only during busy periods.

Luxembourg has no incentive scheme on CRSTMP causes in place. However, ANA follows the trends in all causes, including weather.

The average delay (terminal traffic) in all delay categories remains at a low level. It should be kept in mind that the increase in delay was due to the installation and test of a completely new surveillance chain. The increase of delay as of mid-2019 was caused by the necessary safety measures that had to be put in place. Every stakeholder was advised and approved the mission of ANA to deliver a safe service, even though the temporary restrictions slightly impacted capacity.

ENVIRONMENT

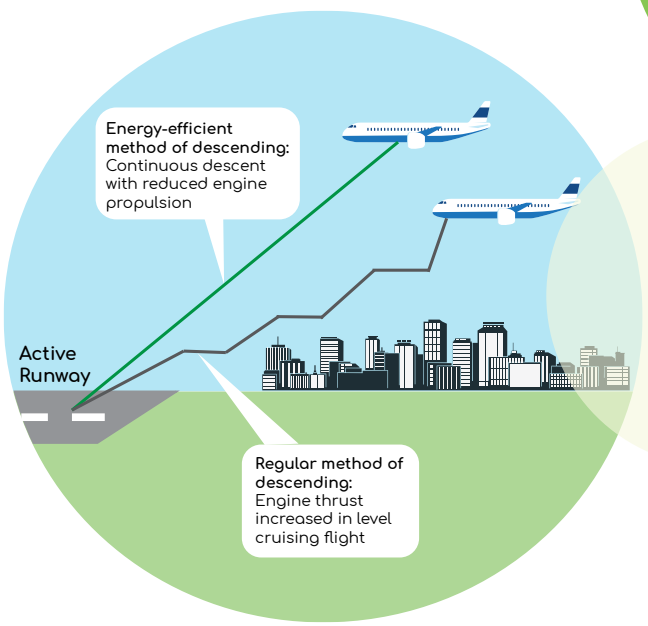
´Sustainability´ is an integral part of ANA's management practice. The EMS Environment Management System is ISO 14001:2013 certified since 2017 and is an integral part of our Integrated Management System (IMS).

EMS is based on six activity areas as 'pillars' of the system: Noise, Air, Water & Ground Quality, Waste, Biodiversity, and Natural Resources. For each area, ANA has developed performance indicators and targets. Environment impact monitoring and assessment schemes for projects have been set up as well as activities helping to develop adjusted countermeasures.

In 2019, ANA committed to achieve the EMAS Eco-Management and Audit Scheme requirements according to EU Regulation 1221/2009, and to applying the Environmental management - Environmental performance evaluation - Guidelines (ISO 14031:2013).

ANA started the ambitious preparation process, setting up measures and targets including all activity areas and business processes.

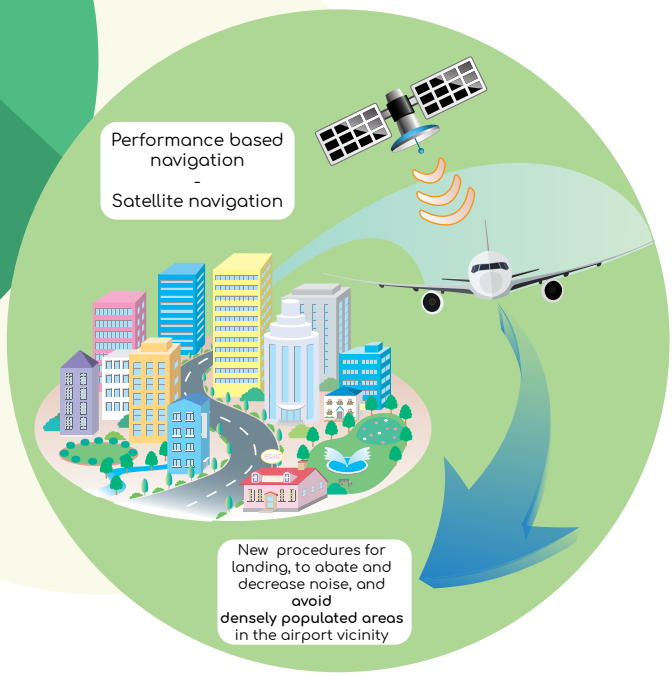
ANA's EMS concerns activities that have or could have a direct or indirect impact on the environment. Especially the effects on which ANA has a direct impact and is solely responsible for are in focus. However, we support and push our partners in areas of shared responsibility to achieve environmental goals.



AVIATION EMISSIONS

One important ATC-related environmental factor for ANA is vertical flight efficiency, i.e. the implementation of Continuous Descent Operations (CDO):

> All CDO procedures were successfully developed, implemented, tested and approved in 2018 and 2019. ANA is proud of the convenient CDO procedures which can be used by all incoming flights. Pilots can be cleared for CDO from any point and any altitude to one of four main points in Luxembourg airspace.



> In 2019, 81% of incoming flights used a CDO approach, an increase of 16% compared to 2018, further reducing noise and NOX emissions and saving fuel during approach. A total of 23 noise complaints were made by citizens, resulting in only 2.4 complaints per 10.000 movements.

In 2019, ANA actively supported the airport to:

- Reduce the average additional taxi-out time/flight.
- Further decrease the average additional time in terminal airspace for arriving aircraft (ASMA) to 0,50 min/flight - a 10% reduction from 2018.
- Manage to reduce night flights by 7% compared to 2018 and granted exemptions from curfew, thanks to ANA's role to find an agreement with Cargolux. The latter was below target in 2019 with 28% less compared to 2018.
- Develop a concept for a new run-up area for aircraft engine tests. In parallel, the number of run-ups were reduced by nearly 18 %.
- Adapt a VFR circuit route to decrease aircraft noise affecting the villages Sandweiler and Schrassig.
- Manage and monitor the modulation scheme for terminal charges to honor airlines' efforts using departure hours that are less disturbing to the neighboring communities and for using less noisy aircrafts. (For details see the chapter "Terminal Costs & Revenues" page 23).
- Monitor the effective use and application of de-icing products.

All projects were subject to an initial and – if proven beneficial – detailed assessment of the environmental impacts and measures to reduce them.

Citizens could get information on noise, on projects and plans on environmental matters and complain via the ANA website.

In November 2019, ANA received the European Public Sector (EPSA) - Best Practices Certificate 2019 for the project "A sustainable approach for the management of Air & Ground movements of aircraft in respect with airport residents needs and expectations" for their efforts made in this domain.

ENERGY, WATER, WASTE & BIODIVERSITY

ANA´s plans and targets to reduce energy (fuel, gas and electrical energy) are monitored. This encompasses operation, cooling, water and paper consumption in our facilities and installations, as well as in our administrative buildings.

Equally, the production of different types of waste, the usage and type of service vehicles are part of our EMS. First results indicate that the measures taken - from internal and external awareness campaigns to changes of processes and means used - are proving successful and show overall positive trends.

Heating and air conditioning systems were updated and adapted to new national regulations.

Since 2018, ANA has been purchasing new cars exclusively with plug-in hybrid, respectively full electrical, technology and has reduced the average emissions of the car fleet. The car emissions are monitored and are an EMS indicator.

Other PIs are included in the natural resources pillar, such as paper consumption, water consumption, electricity and fuel consumption (including the consumption of the emergency generators providing back-up supply for the ANS equipment).

ANA will also invest in the water distribution of the airport and install new water meters to improve the water consumption of the entire airport.

ANA, in cooperation with Lux Airport, is producing honey on Luxembourg Airport for the second consecutive year. Our first successful harvests were for the spring honey 2019: 196 honey jars - 23 kg of honey, and for the summer honey 2019: 525 honey jars - 65 kg of honey.

COST EFFICIENCY

EN-ROUTE COSTS & REVENUES

Our partner skeyes is the ANSP for the provision of en-route (ER) services in the common charging zone (Brussels FIR) for Luxembourg and Belgium; Luxembourg upper airspace is managed by EUROCONTROL MUAC.

Luxembourg and Belgium form a common charging zone for ER services. Both ANSPs provide their respective cost parts in full transparency in separate cost tables.

> The actual total costs in nominal terms for the ANA ER cost part were 6,291 M€ in 2018 and 6,543 M€ in 2019, an increase of 4,0%.
>
> The Unit Cost per service unit for the common charging zone was 67,66€ in 2018 with the ANA unit cost part of 2,23 € and 67,55 € in 2019 including the Luxembourg part of 2,22 €.

Luxembourg State does not charge users the capital costs, or the cost of depreciation of investments in the ER (and TNC; page 23) charges. These costs are offset through an equivalent amount in ´Other Revenues´.

> After deductions of over-recoveries and carry forwards from past years and further deductions by ´Other Revenues´ for depreciation and capital costs borne by Luxembourg State, users were charged a final sum of about 6,0 M€ for Luxembourg ANS in 2019.

The amount actually recovered through the Eurocontrol route charges system to Luxembourg was 7,9 M€ in 2019.

TERMINAL COSTS & REVENUES

ANA as Luxembourg ANSP provides approach (APP) and aerodrome control (TWR) services in Luxembourg airspace and on the airport.

ANA does not apply a traffic risk sharing scheme for its terminal services. ANA reimburses users all over-recoveries due to an increase in the number of terminal service units.

The actual costs in 2018 in nominal terms for terminal ANS (only the ANSP part) were 12,102 M€ down from a total of determined costs of 12,293 M€ in the Performance Plan. In 2019, the actual costs in nominal terms were 13,052 M€, up from 12,487 M€ planned for the same year.

The ANSP unit cost per terminal service unit was 204,92 € in 2018 and 186,63 € in 2019.

Without deduction of the costs carried by the State of Luxembourg, the determined unit cost would have been 218,60 € in 2019.

ANA operates a charging scheme for departures from Luxembourg airport with a modulation of the charges based on the Maximum Take-off Weight (MTOW) in accordance with EU Regulation 391/2013 Art 16:[3]

The scheme honors the efforts of airlines to use equipment that emits less noise (based on the aircraft noise certificate in four noise categories, factor E).

Charges are less for flights departing during day times compared to late hours or during night time (>24:00) in three categories, factor D.

[3] The scheme is in operation unaltered since beginning of RP2 (2015).

Costs and unit rate for terminal ANS are in accordance with the EU charging regulation and are exported in separate cost tables for TNC.

Charges due and bills are calculated and issued through (ANA's) charging and billing office. After closure of the billing year, traffic and modulation effects are calculated.

The full amount in excess of the Determined Cost (DC) reduces user charges in the year after the following year (n+2).

The figures in the following table are the ones for the terminal services only (ANSP costs) and show the trend since 2015 onwards. 2019 costs and charges show the further downward trend in Unit Cost charged.

(in k€)	2015	2016	2017	2018	2019
Total determined costs	**10 868**	**11 725**	**12 027**	**12 293**	**12 487**
Inflation adjustment			-186	-402	-382
Traffic adjustment			63	-515	-1 383
Adjust. Determined costs	**10 868**	**11 725**	**11 904**	**11 377**	**10 721**
Other revenues	-1 529	-2 061	-2 034	-1 766	-1 568
Remaining costs (chargeable costs)	9 339	9 664	9 870	9 610	9 153
Total Service Units (PP forecast)	41, 3	43, 0	44, 7	46, 9	49, 0
Unit Cost (in €/SU)	226, 00	224, 80	220, 64	204, 92	186, 63
Annual reduction of DUC (in %)	N/A[4]	- 0, 53	- 1, 85	- 7, 12	-8, 93

[4] N/A as ANA was not subject to EU Performance and Charging Regulation during RP1.

The following table gives the total Determined Cost (DC) in real terms, actual SU's and actual Unit Cost in real terms. The actual unit cost in real terms is 5,3 % lower in 2019 than the Determined Unit Cost mainly due to the traffic increase.

Over-recovered charge, after deduction of the modulation effect, will be given back to users in 2021. Throughout RP2 a total of more than 5 M€ was given (2017-2019) or will be given (2020-2021) back to users in accordance with the principles of the EU Regulation.

The second last row in the table gives the planned vs the actual investments made by ANA in 2019.

	2019 Actuals
Total DC (real terms) for terminal services (.000€)	10 969
Traffic service units (SU´s) (in .000)	56, 00
Actual Unit Cost in real terms (in €/SU)	195, 79
Total Investments (M€) 2019 (total en-route & terminal - ´gate-to-gate´- planned vs. actuals) (M€)	1, 171 / 3, 788
Total Investments (M€) RP2 (total en-route & terminal - ´gate-to-gate´- planned vs. actuals) (M€)	16, 366 / 17, 243
% of CAPEX Target achievement	105%

Note: ANS related investment costs (incl. MET, CNS, AIS/OPS costs) only.

In 2019, the total CAPEX was substantially higher than planned but in line with the overall investment planned for RP2.[5]

Overall, ANA was able to invest a slightly higher but very close to planned CAPEX during the 5-year period of RP2 (see last row amount in table above). In this regard, ANA could keep its promise to renew and modernize its ANS and ATM infrastructure and processes while correctly managing its budgets and finances.

[5] The excess sum of 2019 CAPEX expenses was for projects planned in earlier years

STAKEHOLDERS CONSULTATION

In 2019, ANA maintained close coordination and held meetings with all stakeholders at various levels. Of high importance are the ADIM coordination meetings with DAC, the national supervisory authority in Luxembourg. These meetings address the safety and other regulatory issues in time and find appropriate responses to upcoming issues and audits.

The increasing importance of environmental issues on and around the airport requires regular dialogue and information sessions with neighboring communities and citizens. Participation and involvement of these and other stakeholders is part of ANA´s management culture.

We coordinate and consult the Ministry in charge on plans, changes and respective financial implications. The high investments made in ANA from 2019 onwards are fully supported.

Airport users require close consultation and reporting. The annual Airport User Committee meeting (AUC) gives users a full overview on new developments and plans from an ANS and aerodrome perspective. The financial outturn and terminal ANS charges are explained and the upcoming year's charges that shall be levied in the forthcoming calendar years are in focus.

ANA participates in regional user consultation meetings and attends the Enlarged Committee meetings (CRCO) with users and other ANSPs.

OUR PEOPLE – OUR COMPETENCE

ANA is a workplace offering professional and personal development opportunities. Being able to attract competent and motivated people to work for ANA is central to providing safe, efficient, continuous and sustainable services in air navigation and on the aerodrome. ANA is a small service provider, but we offer enlarged task and job functions and responsibilities to foster a multi-skilled job environment.

ANA continues to increase its visibility as an attractive employer on the job market. We ensure that new recruits and current employees likewise have the right skills, motivation and professional competence, develop them further and maintain them at high levels.

We have built on our culture for effective teamwork, demonstrating leadership and competence, fostering involvement and communication – both, internally and Externally with our partners, stakeholders and suppliers. The department's results achieved in 2019 show this clearly.

The core task of the Human Resources (HR) department in ANA is to continuously ensure that ANA attracts and retains staff of the right caliber and maintains and develops the skills of its personnel at all levels. The training and development needs of our services are regularly established based on a strong relationship with all stakeholders involved – and in alignment with ANA's strategy and the dynamically evolving services and functions.

The HR department is vigilant and exchanges with the services and departments on the needs and changes required and adapts the HR policy accordingly. Formal training in certified services – in ATC, AIS, MET and CNS is done by professional training institutions, recognized for their competence, to ensure that they fit with our internal on-the-job training capabilities.

The overall staff number has not changed much since 2015 for the ANS part of ANA until 2018. The staff number has increased in 2019 and is now comparatively higher (see table, page 29).

Replacing retiring staff and demand in new services required new recruits and organizing introductory and continuous training for them was and still is an immediate requirement. Also, analyzing the need for special training and competence building of existing staff, planning and following up on training progress to ensure that demands are met are other additional and persisting tasks of the HR department.

In 2019, the administrative department that covers Human Resources, Legal affairs, Internal and External communication, Secretariat and Facilities management implemented a number of planned improvements:

Improved efficiency of HR functions and global administrative performance;

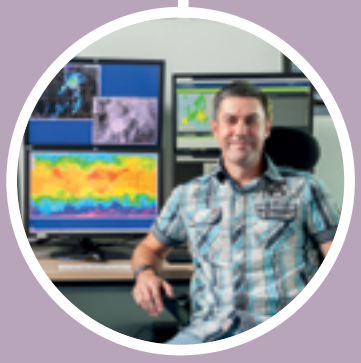
Legal aspects in contracts – validation of contracts, contract execution;

Internal and External communication plan implementation.







	2015	2016	2017	2018	2019
Total Staff ANS and Admin[6]	136	135	140	148	166
ATCOs in OPS	50	48	48	50	62 [7]
Staff in OPS, CNS & MET	53	51	53	55	54

[6] Excluding staff in AER (aerodrome support), ELE (electro-technical) and SIS (fire-brigade & rescue service now integrated into CGDIS)

[7] Including 12 ATCO students at training institutions

OUR WORK AREAS

PROJECT MANAGEMENT

All projects are now integrated in the technical service domains of ANA with a strong strategic lead and decision making, financial, procurement and project management, all in one process.

The new process and management structure for strategical project and change management came into force in July 2019 and helped to improve effective project and financial management.

ANA's projects portfolio for renewing and modernizing our technical infrastructure is ambitious with substantial investments planned and agreed upon. In 2019, ANA could complete 78% of all projects planned and even below planned budget – a big improvement in 2019 compared to 2018.

The table below gives the list of major projects (including non-ANS projects) finished and respective total expenses.

Finalized Projects	Expenses[8]
Surveillance Chain upgrade – Radar and radar network	4. 234. 905€
Data Center – Technical building for CNS	2. 230. 735€
Main power Station South – Airport power supply	1. 470. 276€
eTOD System – electronic Terrain & Obstacle for the country and airport	747. 255€
Meteo Factory – semi-automatic MET information production system	598. 654€
New network infrastructure topology – data network HW and SW	490. 593€
ILS06 replacement incl. RSCU system & Distance Metering Equipment	636. 810€
TAR2 upgrade – Terminal radar new enhanced Mode S sensor	201. 240€
CADMOS – ATC / technical data / information recording system	320. 475€
Future ATM system architecture – virtualization HW/SW	204. 824€
Simulator for aerodrome maneuvering area drivers	122. 444€
MET Lightning detector	80. 478€
GDPR – personal data and information protection system (Phase 1)	67. 638€
2019 Flight procedure reviews	65. 497€
SDDS – Surveillance Data Distribution System	57. 173€
AIS certification as AISP for Luxembourg	49. 140€
Study for new airport engine run-up area	38. 131€
Compliance Management tool (Polarion)	37. 146€
Total	11. 653. 414€

[8] Without expenses invoiced in 2020

ANA´s aim for high achievement in finalizing projects as well as investing cautiously will continue. ANA commits to make every effort to implement in 2020 what is required locally and from the SES plan – despite the current COVID-19 crisis – and be ready for the restart.

CNS DEVELOPMENTS

Communication, Navigation, and Surveillance (CNS) Service at ANA is responsible for technical implementation, maintenance of COM, NAV, SUR equipment and managing the technical realization of respective projects.

The terminal radar system had reached the end of its lifecycle and was not fully compliant with the requirements of EU Regulation 1207/2011. During 2019, a full update of the surveillance system was performed. Since summer 2019, ANA put the updated and renewed operational system in place, data distributed via the SDDS data distribution system.

In 2019, CNS continued with rolling out its brand-new network infrastructure and technical environment. The future ATM architecture will be based on virtual server architecture. Data storage and backup was further improved and a new Air Traffic Control recording and playback system ensures that all relevant ATC data is simultaneously recorded and synchronized.

The Instrument Landing System RWY 06 and related Distance Metering Equipment were successfully renewed in 2019.

The new technical building for CNS was further equipped and hosts the new network and virtual system servers ensuring continuity of services of safety-critical systems and networks. The building also serves as the contingency facility for CNS.

The table in the project management chapter, page 30 includes some more major CNS projects.

ELECTRO-TECHNICAL DEVELOPMENTS

In 2019, the electro-technical service added additional contingency to the aerodrome main power grid by installing an additional power supply connection to an external supplier via the new power station south.

The South station hosts also new auxiliary power equipment ensuring full contingency in power supply.

In 2019, ELE continued to install a new cabling infrastructure for Airfield Ground Lighting and other power installations.

The new power installation enables safe, cost-efficient and environmentally friendly installation of further LED lighting.

Work on the glass-fiber and low-voltage cabling, power supply, and related ground work (ducts) continued in 2019 in preparation for the complete refurbishment of the RWY.

OPS - AERONAUTICAL OPERATIONS

ANA's Aeronautical Operations department consists of two divisions: the ATS Reporting Office (ARO) including the terminal charging unit and Aeronautical Information Management (AIM) including the delegated state obligations unit.

ARO

The ARO division is a certified air traffic services provider with the following tasks:

- Reception and distribution of reports concerning air traffic services;
- Reception, verification, and distribution of flight plans and associated messages;
- Process ATFCM messages to provide information and assistance regarding flow control measures;
- Assistance of ATC with regard to alerting service and transmission of emergency messages;
- Reception and determination of the relevance of emergency beacon detection alerts;
- Reception and transmission of RWY state information and subsequent publication of SNOWTAM;
- Establishment of the invoices for the collection of terminal charges;
- Provision of information for flight preparation.

AIM

AIM is, since early 2019, a certified aeronautical information service provider (AISP) with two main areas of activity:

AIM

AIM – Assurance of correct aeronautical information from origination to publication to ensure the flow of aeronautical information/ data necessary for safety, regularity, economy and efficiency of international air navigation.

TOD

TOD – Collection, management and publication of electronic terrain and obstacle data (eTOD) for the entire national territory, including regular surveys of parts of the neighboring states' territory where airspace delegations have been made.

During 2019, the OPS department was able to develop its services further and increase its competence. A high level of compliance with legal requirements and international standards has already been reached:

- The agreements with data providers have been revised in accordance with ICAO Annex 15 (Ed. 16) and PANS-AIM.
- The service level agreement with skeyes AIM concerning aeronautical data provision, AISP service provision and collaborative use of software has been revised.
- The requirements of EU Regulation 2017/373 on aeronautical data quality for AIM services have been analyzed and addressed by establishing a compliancy matrix and a corrective action plan as well as an implementation roadmap.
- A national ADQ workshop has been held in cooperation with Eurocontrol & INEA.
- The national AIM ICAO data catalogue has been published (www.datacat.lu).

DATACAT.LU

The new tasks and obligations of the AIM division as well as guaranteeing the continuity of H24 service provision of the ARO division raise the need for additional staff and experts for the OPS department:

- In 2019, one trainee finished academic training at ENAC (Toulouse) and will be released for duty upon completion of on-site training in 2020.
- Two new trainees will be hired and are beginning their academic training in 2020.
- One ARO expert joined the team in 2019 and a geomatics expert is scheduled to start working for OPS in early 2020.

METEOROLOGICAL SERVICES

MeteoLux, the provider of aeronautical meteorological services within ANA, is compliant with the relevant ICAO standards and European regulation applicable to aeronautical MET services. MeteoLux delivers a high level of service quality and integrity to airspace users, ANA ATC and Luxembourg Airport.

MeteoLux is also delivering non-aeronautical services to other national parties in Luxembourg. The funding of aeronautical and non-aeronautical services is transparent and responsibilities are clearly defined.

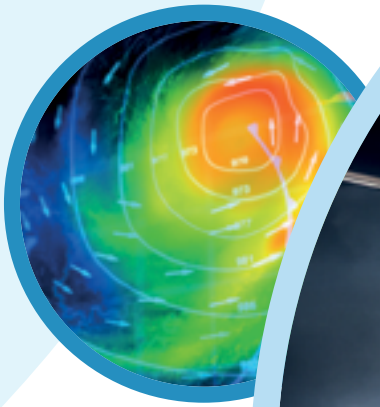
In February 2019, MeteoLux was designated as the MET Authority in Luxembourg, providing additional services in conformity to regulations.

In 2019, MeteoLux delivered safety-critical highly reliable data and information to all users on time and above set targets.

MeteoLux is supported by a team of technicians ensuring the continuous availability of all safety critical MET equipment and facilities at high standard. During 2019, there were no major outages or loss of service.

The provision of MET information to non-aeronautical users via the new MeteoFactory system was an important step forward in 2019. The semi-automatic production system provides customized and on demand Public Weather Services to end users via transmitted products or via the internet.

MeteoLux is a partner of the MET Alliance and member of EUMETNET with other partners in FABEC to share competence and experience in all areas of MET services provided.



AERODROME MANEUVERING AREA

The team of aerodrome experts (AER) in ANA has operational responsibility for the maneuvering area.

This includes works on the aerodrome infrastructure – RWY and TWYs and the maneuvering area – together with the airport partners lux-Airport as the certified and assigned Aerodrome Operator and the Luxembourg public service entity ´Ponts & Chaussées´, responsible for maintaining tarmac areas, providing winter-services (RWY/TWY decontamination) and doing ground works required on the airport area.

AER is furthermore responsible for the coordination and supervision of the winter operations on the maneuvering area and for the design and layout.

The responsibilities for the team are clear. During 2019, the team continued to provide inspection services, revised or maintained RWY/TWY markings and other signaling equipment, and manage and monitor wildlife on the airport (i.e. bird strikes, monitoring species roaming etc.).

During 2019, a number of changes and new tasks were handed to the AER team:

In summer 2019, AER took over the RWY/TWY inspection task from the airport fire brigade and rescue service (CGDIS) and FOD detection/removal. The team was joined by new members that received in-house training as inspectors.

Since October 2019, the team is responsible for doing friction testing from 0400-2400 hours.

AER provides and organizes airside driver training (A and B) (simulator training for class B drivers) and provides English phraseology training on ground-frequency together with Luxembourg airport and airlines. In the future, tow-tug training will be added.

The study on a new aircraft engine run-up area was finalized and presented to the stakeholders.

During 2019, a total of 523 hours of RWY work was performed. The RWY was only closed for 1 hour and 15 minutes during usually scheduled opening hours due to urgent repair work. Snow removal accounted for 2 hours of closure in early 2019.

DEVELOPMENT OF FINANCE PROCESSES

ANA further improved its internal finance processes by:

- Adopting rules and procedures for budgeting, tendering, procurement, and control of budget execution in all projects.
- Since the beginning of 2019, all purchases undergo a triple check of requests in SAP.
- The former COM and SUB accounts are now fully merged; all commercial accounting is done in-house.
- The process for the timely depreciation of assets was improved.
- The validation and monitoring of purchases by our internal legal and purchase departments is ensured.

FINANCIAL SITUATION 2019

The official 2019 Financial Statements are available upon request.

GLOSSARY

Abbreviation	Meaning
ADIM	ANA-DAC coordination meeting
ADQ	Aeronautical data quality standards
AER	ANA aerodrome department
AIP	Aeronautical Information Publication
AIS	ANA AIS division
AISP	Aeronautical Information Services Providers
AIM	Aeronautical information manual
ANS	Air navigation services
ANSP	Air navigation service provider
APP	ANA approach division (ATC with radar)
ARO	ANA aerodrome reporting office division
ASMA	Arrival Sequencing and Metering Area
ATC	Air traffic control
ATCO	Air traffic controller
ATFCM	Air traffic flow control management
ATFM	Air traffic flow management
ATM	Air traffic management
ATM SE	Air traffic management special equipment (technical equipment used to provide ATS)
ATM Masterplan	European ATM development plan
ATS	Air traffic services
AUC	Airport User Committee
BP	ANA 5 year Business plan
CADMOS	Software used to replay ATC voice and radar recordings for investigating purposes
CAPEX	Capital expenditure
Cat (I & III)	Approach types for an ILS
CDO	Continuous descent operations
CERT	ANA department responsible for certification
CGDIS	Airport firefighting department
Class (AA A+B AA+A+B)	Technical incidents severity classification
CNS	ANA division providing Communication Navigation and Surveillance
COM	Communication, CNS area of responsibility
COM	Commercial part of the ANA budget
CRCO	Central Route Charges Office
CRSTMP	Capacity, Routing, Staffing, Technical ATC equipment, Airspace Management, Special events (weather excluded).
CWP	Controller working position
DAC	Direction de l'aviation civile
DC	Determined costs
DUC	Determined unit costs
DME	Distance measuring equipment, part of the ILS and VOR
EGNOS	The European Geostationary Navigation Overlay Service
ELE	ANA Electro-technical service
EMAS	Eco-Management and Audit Scheme, an environmental certification ANA holds
EMS	Environmental management system
ENAC	École nationale de l'aviation civile, French training provider
EoSMS	EASA conducted yearly SMS survey
EPSA	European Public Sector Award (EPSA) which ANA received in 2019
ER	En-Route
ESSP	European Satellite Services Provider
eTOD	Electronic data repository
EU	European Union
EUMETNET	EUMETNET is a network of 31 European National Meteorological Services
Eurocontrol	It is an international organisation working to achieve safe and seamless air traffic management across Europe
FABEC	Functional Airspace Block Europe Center, ANSP cooperation organization for Germany, the Netherlands, France, Belgium, Luxembourg, Switzerland and MUAC
Factor E, factor D	Environmental and noise factors included in the TNC
FIR	Flight information region

GLOSSARY

Abbreviation	Meaning
FOD	Foreign object debris
FPP	Flight Procedure Programme
GDPR	Data protection registration
H24	24 hour operation
HMI	Human machine interface
HR	Human resources
HW	Hardware
ICAO	International civial aviation organization, a UN agency
IFR	Instrument flight rules
ILS06	Instrument landing system for RWY06
INEA	The Innovation and Networks Executive Agency is an executive agency established by the European Commission in order to run the Connecting Europe Facility
IntACT	FABEC audit group and program
IMS	Integrated Management System
IRICE	Integrity, respect, innovation, commitment, excellence
ISO	The International Organization for Standardization is an international standard-setting body
KPA	Key Performance Area
MET	ANA Meteorological department
MO	Management objective
MTOW	Maximum take-off weight
MUAC	Maastricht Upper Air Control
Mvmt	Air traffic movement
NAV	Navigation, CNS area of responsibility
NOX	In atmospheric chemistry, NOx is a generic term for the nitrogen oxides that are most relevant for air pollution
OPS	ANA Aeronautical operations department
PANS-AIM	Procedures for Air Navigation Services of Aeronautical Information Management
PBN	Performance based navigation, a satellite based navigation system for aircraft
PI	Performance Indicator
Polarion	A SIEMENS compliance software tool
PP	Performance plan
RNP	Required navigation performance, for GPS approaches
RP2	SES performance scheme Reference period 2 2015-2019
RSCU	Back-up radio system for ATC
RWY	Runway
SAF	Safety
SAP	Accounting software program
SDDS	Surveillance data distribution system
SES	Single European Sky
SESAR	Single European Sky ATM Research is a collaborative project to completely overhaul European airspace and its air traffic management.
SLA	Service letter agreement
SMS	Safety management system
SNOWTAM	A special message to airmen regarding snowfall at an airport
SU	Service unit, used to determine ANSP costs
SUB	ANA part of the budget covered by the state
SUR	Radar surveillance
SW	Software
TAR2	Secondary radar of ANA
TNC	Terminal navigation charges
TOD	Top of descent
TWR	ANA ATC division
TWY	Taxiway, surface area used by aircraft to reach the runway
UN	United Nations
VFR	Visual flight rules
VOR	Ground based navigation aid

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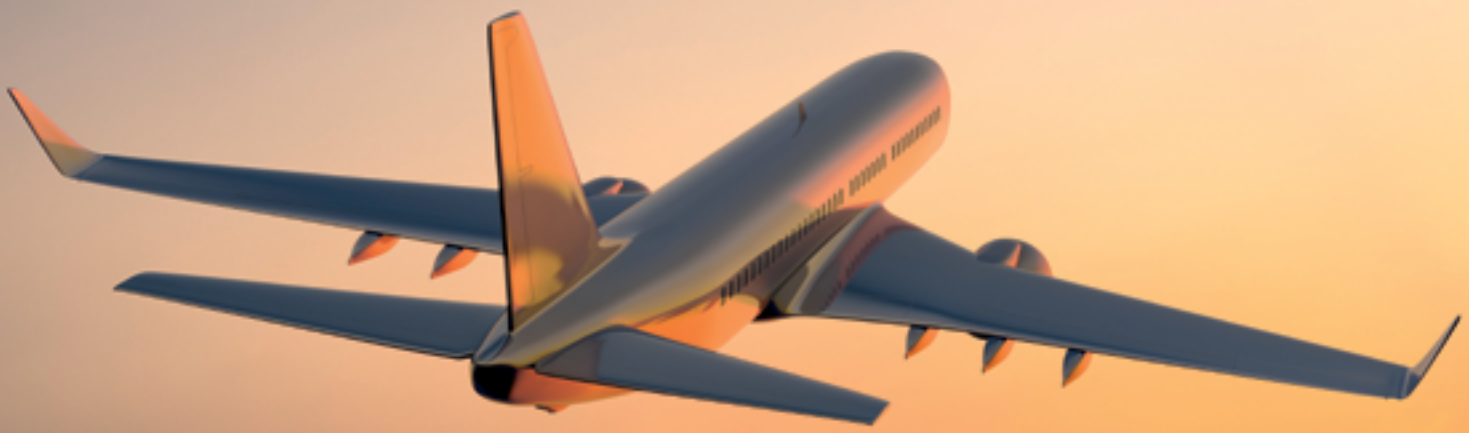

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