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53rd Paris Air Show Le Bourget

**SUSTAINABLE
AVIATION
INDUSTRY**

**AERONAUTICAL
INDUSTRY**

**AIR
TRANSPORT**

**INTERNATIONAL
COOPERATION**



ENCOUNTERS

- 03**
With François de Rugy, Minister for the Ecological and Inclusive Transition
- 04**
With Élisabeth Borne, Minister for Transport
- 05**
With Éric Trappier, Chairman of the French Aerospace Industries Association
- 06**
With Patrick Daher, Chairman of the Paris Air Show Le Bourget



02

SUSTAINABLE AVIATION INDUSTRY

- 08**
CORSIA takes off
- 10**
French government's Big Investment Plan: multi-year, coordinated support for aviation industry
- 11**
New flight plan for CORAC
- 13**
Development of a sustainable aviation fuels sector

AERONAUTICAL INDUSTRY

- 15**
A new action plan fostering aviation industry competitiveness
- 17**
Civilian UAV use is maturing
- 19**
French council for air transport cybersecurity: France shows the way
- 20**
Thales: focus on connectivity and autonomy

AIR TRANSPORT

- 22**
DSNA invests in SESAR
- 24**
Remote control of aircraft at an aerodrome
- 25**
Roissy-CDG and Le Bourget: fields of innovation
- 26**
The H160: a concentrate of applied technology
- 27**
A300B... with B as in Bourget!
- 28**
"Security Vision": partnering toward improvement

INTERNATIONAL COOPERATION

- 31**
A Single Sky for Africa
- 33**
France keeps on with its cooperation with Eastern Europe and the Balkans
- 34**
European twinning: a tool to promote convergence
- 35**
The Indian Ocean rises to the security challenge
- 36**
Flawless support for industrial exports
- 37**
ENAC helps promote French know-how worldwide
- 39**
A new heading for DSNA Services

aviation civile Special Edition **53rd Paris Air Show Le Bourget**

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FRANÇOIS DE RUGY
Minister for the Ecological and Inclusive Transition

○

The ecological transition of civil aviation

Every two years, the Paris Air Show provides the opportunity to showcase civil aviation and salute the technological progress in this sector, a sector that plays such a paramount role in the economic, tourist and cultural exchanges between nations. Today, civil aviation is facing one of the biggest challenges in its history: its ecological transition. The urgency of the ecological situation is forcing civil aviation to pay ever more attention to its environmental impacts, particularly considering the growth in the sector. The sustainable development of civil aviation constitutes a key line of strategy, promoted as such in the National air transport strategy presented by the French Transport Minister, Élisabeth Borne, last March in her closing speech to the « Assises du transport aérien » (air transport convention).

There are multiple issues at stake, ranging from energy transition via carbon reduction in the sector, to limiting noise nuisance affecting residents around airports and the overflowed populations, and including the questions of air quality and the preservation of airport biodiversity. These issues have both global and local dimensions, and must be treated consistently, seeking synergies between the actions. The goal is ambitious but not inaccessible.

The national air transport strategy identifies more precisely the projects to be conducted in the short term, and the level of the actions to be deployed. Internationally, combating climate change constitutes a major strategic axis. International aviation is the first industrial sector to adopt a global mechanism for offsetting its CO₂ emissions: CORSIA. Since January 1st, airlines and States have been

monitoring, checking and declaring the CO₂ emissions from international aviation. The European Union will be sure to tie this mechanism in with the European carbon market, already in force for intra-European flights. Other levers are being used, such as the development of increasingly stringent standards for engine emissions. Action for the climate is also taken on a national scale, with the objective of attaining the European climate goals. The desire to support the deployment of sustainable aeronautical biofuels across the territory, by favouring products deriving from the circular economy, is also playing its part. Still on a national scale, a roadmap has been drawn up with a view to sensitising and mobilising all stakeholders in safeguarding airport biodiversity. Around airport platforms, continued consultation between State, air transport professionals, elected representatives and local populations is vital for ensuring that concrete solutions emerge which make it possible to limit the levels of nuisance, whether in terms of noise pollution or air pollution.

Over the longer term, profound developments are expected in modes of transport and aircraft design, to take ever better account of the challenges inherent in this ecological transition. The responses will combine technological, economic and political considerations. These responses will be many, varied and innovative, involving the public authorities alongside all stakeholders in the sector, with each response playing its part in controlling the environmental impacts of aviation. It is vital that these responses emerge to ensure the acceptable development of air transport. We need to face these challenges together, boldly and responsibly. ●

1. Carbone Offsetting and Reduction Scheme for International Aviation.



ÉLISABETH BORNE
Minister for Transport



Coordinate the efforts of the entire industry to respond to the major changes that lie ahead

I am delighted to participate in this year's Paris Air Show, which is an exceptional opportunity to meet all the players in the aeronautical industry. This strategic sector for our country is the top contributor to our trade balance, and the Paris Air Show is an excellent showcase of our expertise which is at the forefront of global technology.

It is also a key event for both manufacturers and the French government where research and development projects are reviewed at a special French Council for Civil Aviation Research (CORAC) meeting. This work aims to design technologies that are essential for the next generation of aircraft which will have to meet more requirements, particularly with regards to ecological and energy transition.

CORAC plays a central role in coordinating the efforts of the entire industry, from SMEs and mid-caps to major industrial groups, to respond to the major changes that lie ahead: energy transition to significantly reduce the environmental impact of aircraft, both in flight and on the ground (CO₂ emissions, noise); digital transformation for greater aircraft connectivity and the development of more autonomous aircraft; and, finally, improving industrial competitiveness to reduce the development cycles of new aircraft to accelerate fleet renewal and reduce the environmental impact of air transport.

Airbus currently produces about half of the world's 100-seat and over aircraft and Safran 70 percent of short and medium-haul engines through the CFM International joint venture with General Electric. This leading role demonstrates the performance of the French and European aeronautical industry; it also underlines

its responsibility in innovation and choices for the construction of tomorrow's aircraft.

French manufacturers have achieved this leadership position by investing nearly a billion euros a year in research in recent years, and, in the face of unprecedented research efforts, particularly to prepare for technological breakthroughs (energy efficiency, hybrid aircraft, etc.) that the changes ahead will require, the French government needs to assist.

As such, in 2018, the Government stepped up its aeronautical research support policy, historically managed by the French Civil Aviation Authority, by allocating an additional budget of €135 million per year under the Grand Plan d'Investissement (Big Investment Plan).

This action naturally extends to the Framework Programme for Research and Innovation, Horizon Europe, which will begin in 2021. The work undertaken in France is intended to prepare the large-scale technological demonstrations that will be part of the future European public-private partnership for aeronautical research, the creation of which is fully supported by the French government. ●



ÉRIC TRAPPIER

Chairman of GIFAS (Groupement des industries françaises
aéronautiques et spatiales – French Aerospace
Industries Association)

○

Aerospace in France: an efficient, dynamic and mutually-supportive industry

BY Olivier Constant

What were the main results and trends in 2018 for the major corporate clients, the equipment manufacturers and the SMEs?

2018 was an excellent year for the French aerospace industry as a whole. This performance was driven in particular by continuing strong air-traffic growth: up 6.5%. What is more, passenger numbers are set to double by 2037. This growth does nonetheless set a certain number of challenges for the civil aviation industry, in particular in terms of production ramp-up. This is therefore one of the concerns of the entire supply chain, from the contracting clients to the SMEs. Concerning the trends on the other markets, business aviation showed a slight upturn. The civil helicopters market remains fairly stagnant, unlike the market for military helicopters which is again showing encouraging signs. Space is still at a crossroads, and as for the defence sector, it is demonstrating great stability. Being a dual industrial channel is therefore an asset. Concerning equipment manufacturers and SMEs, the trend is globally positive, but it is up to the entire industry to remain vigilant with regard to its competitiveness, including internationally.

What conclusions can GIFAS draw from the 10 years of activity of CORAC?

The French Council for Civil Aviation Research (CORAC), in which the DGAC is a major stakeholder alongside GIFAS, is strategic. Its new roadmap aims to synchronise the efforts of the industry (aircraft manufacturers, engine manufacturers, system manufacturers, laboratories and SMEs) to prepare for the next generation of aircraft, due to come into service between 2025 and 2030 and beyond. With this new roadmap, three broad lines of research have been defined: the optimised-energy aircraft, the connected and autonomous aircraft, and new methods for development and production in the industry of the future. I would like to point

out that, since the creation of CORAC, the volume of industrial research has increased by 80% across the entire industry, representing today more than €900 million of business per year, two-thirds of which are self-funded by the companies themselves. CORAC has had a knock-on effect for all those concerned since, over this period, the activity of the mid-tier companies and SMEs has increased 2.5-fold. More than 300 of them are today stakeholders in the CORAC research programmes. This is remarkable, and it demonstrates clearly the robustness and solidarity of the industry. Lastly, the results from CORAC are highly conclusive, with major contributions to the performance of the Airbus A350-1000, the A320neo, the Airbus H160 helicopter and the Leap engine.

Concerning jobs in the industry, what are the prospects, and are there still difficulties in recruitment?

2018 was once again a positive year in terms of jobs, with around 15,000 new recruits. The trend is once again on the up, since our industry needs to invest in new skills and attract the necessary talent. These figures should not obscure the need to pursue the actions of GIFAS for enhancing the appeal of trades and training, as there are recruitment difficulties in certain trades or employment catchment areas. In terms of training, therefore, we shall be pursuing in 2019 the efforts embarked upon in the regions. The same applies to on-the-job training, with more than 7,300 professional training and apprenticeship contracts currently in place in our industry. This represents a 7% increase in one year, and we estimate that in 2020 we will have doubled our headcount of apprentices over 10 years. Lastly, the 53rd Paris Air Show offers the opportunity to repeat the “L’Avion des Métiers” operation aimed at young people, their parents and teachers. ●



PATRICK DAHER
Chairman of the Paris Air Show
Le Bourget

Paris Air Show 2019: the show that's a must

From 17 to 23 June, the 53rd edition of the International Paris Air Show, at Le Bourget, promises to be a summit meeting for professionals from the world over. Technological innovations, environmental issues, improved safety: all challenges to be faced by a booming sector.

BY **Béatrice Courtois**

The success of the world's biggest air show, twice as large as the Farnborough air show in the UK, shows no signs of letting up. *"Stand bookings are matching, even exceeding, those of 2017. We are expecting 2,500 exhibitors, 30 national pavilions, 47 countries and 150 aircraft. Let us also note the presence of many French regions,"* says a delighted Patrick Daher, chairman of the Paris Air Show. This major international gathering remains the tangible sign of a booming industry, particularly in Asia and Africa, and which is mobilised to face major challenges. The Paris Air Show is also an unmissable meeting place for presenting technological solutions to these challenges and providing impetus for partnerships between stakeholders in the sector.

Innovation and seduction

This year, once again, conferences, workshops and roundtables will allow professionals to exchange their respective experience and knowledge. Reducing the impact on the environment, perfecting aircraft design, or pursuing the quest for total safety management: there is no lack of subjects to discuss. The Paris Air Lab space, dedicated to research, innovation and anticipation, will present many start-ups and propose various activities throughout the week. "L'Avion des Métiers" will present the activities of companies that are involved in aircraft

manufacturing and related jobs. With the aid of a giant model aeroplane, individuals will be able to seek out the companies that work on any given part. It is a place for discovery and dialogue with the men and women who, together, are building the aviation industry. *"We wanted to make this space even more convivial and instructive,"* explains Patrick Daher. *"The objective is to attract fresh candidates to this industry, which has evolved enormously in developing the numeric, the digital and all the new technologies."* The DGAC will also be contributing to the promotion of the aerospace trades. At the initiative of the Social Affairs and Labour Law Mission of the DTA (French Air Transport Directorate) and the French employment agency, Pôle Emploi, in association with DIRECCTE¹ Île-de-France, a stand will be dedicated to discovering the aviation trades, and open to both young people and people looking for a career change. Lastly, the visitors - both professionals and the general public - will be able to marvel in admiration at the prowess in flight of all kinds of aircraft. Once again, the Paris Air Show will be sure to live up to its promise. *"It is always a fabulous party, both for us and the public,"* says Patrick Daher. A party not to be missed, then, whether as a simple spectator or a committed stakeholder in the sector. ●

1. Regional directorate for companies, competition, consumption, work and employment.



SUSTAINABLE AVIATION INDUSTRY

08
CORSA takes off

10
French government's Big
Investment Plan: multi-year,
coordinated support for aviation
industry

11
New flight plan for CORAC

13
Development of a sustainable
aviation fuels sector



Corsia takes off

Less than one year after the closure of COP21, in Paris, international aviation has adopted a new measure designed to combat climate change. The offsetting mechanism for CO₂ emissions produced above their level of 2020, CORSIA, entered its initial implementation phase on 1st January of this year.

BY **François Blanc**



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In autumn 2016, the International Civil Aviation Organisation (ICAO) adopted an historic and unprecedented resolution: its Member States committed to a binding procedure for controlling their CO₂ emissions. The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) completes the basket of measures already adopted by ICAO. The initiative undertaken worldwide is built around four principles. The first is to produce fewer emissions at the source by building aircrafts that are more fuel-efficient. The second principle concerns the development and use of sustainable fuels, synonymous with a significant reduction of carbon emissions. In parallel, the development of new air navigation procedures will improve the environmental efficiency of international aviation. Lastly, the mechanism for offsetting emissions produced above the limit, which will be determined at the

end of 2020 by ICAO, constitutes the economic aspect of the programme.

FIRST PHASE UNDERWAY

The first phase of application of CORSIA¹, effective as from 1st January 2019, aims at measuring the fuel consumption of the airlines, and therefore their volumes of CO₂ emissions. These volumes must be validated by the Member States in the framework of an MRV (Monitoring, Reporting and Verification) procedure. Based on the data transmitted by the States, ICAO will calculate the average carbon emissions for 2019 and 2020. The result obtained will then become the CO₂ emissions baseline, above which the airlines have to offset their emissions. CORSIA stipulates that each extra ton of CO₂ from 2021 must be offset by the purchase and cancelling of an equivalent unit of one tonne of CO₂ on a market created for this purpose. These units will be

40 MILLION
THIS IS THE NUMBER
OF TONNES OF CO₂ THAT
SHOULD BE OFFSET FROM 2021
BY THE AIRLINES, THANKS TO CORSIA.
WITH THE GROWTH IN AIR TRAFFIC,
THIS VOLUME COULD EXCEED
600 MILLION TONNES IN 2035.



© Zoo Studio for ADP

derived from emissions-reduction or carbon-capture projects, in particular in the developing nations. To be used in the framework of CORSIA, these units will of course have to be previously recognised as eligible by ICAO, with regard to their proven contribution to the fight against climate change.

EUROPEAN MARKET MEASURES

Through adopting this CO₂ emissions offset mechanism, international aviation becomes the first economic sector to be equipped with a global mechanism for combating climate change. France is steadfastly committed to this approach, which is in line with the objective set by the international community at COP21 in December 2015 in Paris: to limit temperature increase to less than 2°C in the course of this century.

Regionally, the European Economic Area (EEA, comprising the States of the European Union along with Norway, Lichtenstein and Iceland) had previously set up market measures which have included the aviation from 2012. The EU-ETS (European Union-Emission Trading Scheme) is a mechanism aimed at limiting the emission of greenhouse gases from stationary installations, and from airlines operating flights within the EEA. Within the limits of this cap, companies receive or purchase emission allowances that they can exchange with other companies. In the launch phase, the mechanism offers a certain number of free allowances each year, progressively reduced to stimulate the efficiency of the system. The aviation sector initially had 85% of free allowances, which today is down to around 50%.

With the arrival of CORSIA, it will be up to the European Commission and the Member States to make proposals to ensure the perfect interaction of the two mechanisms in the EU law. ●

→ Support

France mobilises for ACT-CORSIA

In July 2018, the Secretariat of ICAO launched the ACT-CORSIA (Assistance, Capacity Building and Training) initiative. Its objective is to offer training on the implementation of CORSIA to each one of the 94 ICAO Member States requesting it. Among the 15 States that volunteered for providing this training, France - in association with Canada - stands in the foreground. Along four missions, France has indeed provided support to 18 States, in particular in French-speaking countries of Africa, which represents about 20% of the initiative's beneficiaries. These intensive, three-day sessions took place between October and December 2018. The purpose was to review all the aspects of CORSIA, in particular its practical implications. For the recipient States, this involved developing their regulatory framework in order to integrate CORSIA in their national law. Carriers based in these countries were invited to endorse their new obligations, in particular through the establishment of a monitoring plan for their CO₂ emissions. The beneficiary States were also assured by the French authorities that they would receive support beyond these training sessions, according to their needs.

1. Carbon Offsetting and Reduction Scheme for International Aviation.



French government's Big Investment Plan

Multi-year, coordinated support for aviation industry

By providing multi-year visibility on government support for the French aviation industry, the Big Investment Plan aims to coordinate the research and innovation efforts of all aeronautics stakeholders to develop their competitiveness and face future technological challenges.

BY **Henri Cormier**

A breath of fresh air for the aviation industry is how the public support provided under the Big Investment Plan presented by the Prime Minister in late 2017 can be summed up. A total of 675 million euros over five years will accompany *"this industry, France's leading export sector, which is characterised by lengthy cycles and capital-intensive projects"* (Rapporteur on the Big Investment Plan, Jean Pisani-Ferry). Environmental performance, improved safety, efficiency of operations, industrial excellence, etc., the Big Investment Plan supports CORAC's¹ work in all areas and confirms DGAC's (French Civil Aviation Authority) key role in defining and implementing the national support policy for the aviation industry. This responsibility offers some leeway to initiate effective

actions in an industry-wide vision while imposing proof of clear and measurable impacts in return. *"The DGAC's role is to maximise the effects of the Big Investment Plan's aeronautics action"*, stresses Aymeric de Loubens, Head of Research policy office at the Aviation industry department of the DTA (French Air Transport Directorate). *"This involves developing an annual research programme consisting of a coherent set of priority projects for the industry, selected according to very strict impact criteria and rigorously monitored throughout implementation. Beyond that, this action provides a solid basis for stepping up interaction with other sectors, seeking a multiplier effect on regional economic policies, and influencing European research programmes."*

INTER-DEPARTMENTAL GOVERNANCE

In addition to the DGAC's coordination of the efforts of the various stakeholders through CORAC, the Big Investment Plan offers the advantage of placing the aviation industry's support policy in an inter-departmental framework. The involvement, alongside the DGAC, of the competent services of the ministries in charge of research and industry provides the aviation industry with a broader vision on issues, such as batteries, electronic components, new materials, and artificial intelligence. This inter-departmental governance also gives more weight to the industry's action in Europe and makes it more efficient in non-aeronautical areas which are at an early stage of development. These are all assets to better address the major technological changes in progress and to meet the industry's growing research needs, because, behind these competitiveness issues, the preservation and development of skilled jobs within the industry are also at stake. ●

1. French Council for Civil Aviation Research.

Viewpoint



AYMERIC DE LOUBENS,
HEAD OF RESEARCH POLICY OFFICE AT
THE AVIATION INDUSTRY DEPARTMENT
OF THE DTA

The demanding framework of the Big Investment Plan sets in motion a virtuous circle, benefiting the entire aviation industry, based on the visibility of Government support, the continuity and synchronisation of the industry's research efforts, the quality of project implementation, and the clarity and readability of impacts. It is also a framework conducive to designing and implementing a comprehensive and coherent support policy from regional right up to European level."

New flight plan for CORAC

Ten years after its creation, the French Council for Civil Aviation Research (CORAC) has designed a new roadmap to develop technologies for the next generation of aircraft and increase the aviation industry's competitiveness. Explanation.

BY **Henri Cormier**



© AIRBUS / Ramadier Sylvain

There has been a slight change of direction for the CORAC: during its tenth meeting in December 2017, all stakeholders – French government ministries, French Aerospace Industries Association (GIFAS), manufacturers, research organisations, airlines, and airports – established a new technological roadmap. This roadmap, built around three main priority areas, reflects strong trends in the aeronautics market: reducing the environmental footprint of air transport, opening up to new mobility needs and new uses for aircraft, and finally, the industrial transformation of the sector.

The first of these areas focuses on improving energy efficiency, with a target of 20% gain for the next generation of aircraft expected by 2025-2030. As such, CORAC is focusing its efforts on ultra high bypass ratio engines and their integration, electri-

fication of non-propulsion systems, and the use of composite materials. Configuration and propulsion breakthroughs for commercial aircraft after 2030 need to be prepared for at the same time by maturing key technologies on smaller aircraft. Among these breakthroughs, electrical hybridisation of aircraft is already a key area of work. “CORAC’s new roadmap has changed the way it works and the way it approaches topics”, says Aymeric de Loubens, Head of the Research policy office at the Aviation Industry Department of the DTA (French Air Transport Directorate). “The aim is to find synergies between themes, based on a more systemic vision. For example, faced with the advent of electric power in aeronautics, it is now relevant to consider the energy-propulsion chain as a global system.” This approach is fully in line with CORAC’s shared vision and requires developing cooperation between aircraft, engine and equipment manufacturers. ●●●



42
PROJECTS WERE
INITIATED IN 2018
UNDER CORAC.



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●●● **The second strategic area** of this roadmap addresses technologies for connected and autonomous aircraft which will involve a radical transformation of flight and ground operations. Regarding piloting, advanced pilot assistance functions first need to be developed, and then crew workload needs to be reduced, potentially leading to a reduced crew cockpit. In the field of maintenance, CORAC is focusing its work on the individualised assessment of the condition of each aircraft, the simplified execution of operations, and the automation of damage assessment on aircraft. Finally, the progressive autonomy of ground handling, turnaround time reliability, and minimizing the risk of impact on parked aircraft are among the goals pursued in the field of airport operations. The greater efficiency and flexibility of operations resulting from all these advances must also support increasing air traffic while maintaining a maximum level of safety.

REDUCE DEVELOPMENT AND PRODUCTION CYCLES

In the final area of its roadmap, CORAC stresses the need to rethink the aeronautical industrial model to gain in competitiveness. Given historical production rates in commercial aviation, industrial excel-

→ Anniversary

10 candles and an effective partnership

Created in 2008 to synchronise and optimise the research efforts of the various stakeholders in the aviation industry, CORAC is confidently entering its second decade of existence. It is confident in the effectiveness of its strategy as well as in the solidity of its foundations: its research work has significantly contributed to the industry's products of excellence (H160, A350, LEAP engine), which ensure industry's current commercial success. This partnership, which brings together the French government and the industry around shared strategic objectives, is now seeking to broaden its base of partners through aeronautics clusters, with the aim of multiplying its action in regions and reaching out to all of the industry's skills. *"This roadmap has been developed for the future to feed, at different levels, all industry support programmes for greater overall efficiency"*, notes Stéphane Cueille, Chairman of the CORAC Steering Committee. The strength of CORAC's vision is also a major asset in influencing thematic areas of Horizon Europe, the future European research programme. This programme will provide a natural extension of CORAC's work, after 2020, to demonstrate large-scale technologies and uses involving the sector's European regulatory authorities.

lence has never been more important. *"To increase the aviation industry's competitiveness, collaborative working tools must be developed to reduce aircraft development cycles. The aim is to move towards new certification methods and implement tools allowing the various stakeholders in the value chain to interact more and co-design with the ultimate aim of reducing decision cycles and increasing performance"*, says Stéphane Cueille, Chairman of the CORAC Steering Committee and R&T and Innovation Director at Safran. These new methods are expected to ultimately reduce development and production cycles by 30% and thus help fleet replacement, which is essential to improve the environmental footprint of air transport. ●

Development of a sustainable aviation fuels sector

The use of sustainable aviation fuels is one of the four key orientations in ICAO's 'basket of measures' to limit CO₂ emissions from air transport and begin its decarbonisation. In this perspective, France has stepped up its efforts to deploy these sustainable aviation fuels.

BY **Henri Cormier**

The issue is no longer under discussion in the aviation sector: sustainable aviation fuels are an essential lever to limit CO₂ emissions from air transport in the future. This is also what came out of the ICAO conference on this issue in October 2017. In their statement, conference members stressed how urgent it was *“to expand the use of Sustainable Aviation Fuels as aviation has fewer technological alternatives to reduce carbon dioxide emissions than other transport modes, even if there are early-stage efforts to develop hybrid and electric aircraft.”* It is all the more imperative to develop this area because the sector's impact in terms of CO₂ emissions could soar as a result of sustained growth in air traffic expected for the foreseeable future. After two years of experimentation on 78 flights which ended in May 2016, Air France's Lab'line for the future operation demonstrated that the use of a technically certified biofuel¹ did not differ with that of fossil fuel.

NATIONAL AND INTERNATIONAL COORDINATION

The public authorities are now taking serious interest in this issue, as shown by the Engagement for Green Growth (ECV) signed in December 2017. This public-private partnership² aims to promote the emergence of an economically viable French sustainable aviation biofuels supply chain. On the R&D

side, the ANCRE³ presented in June 2018 a major technical and prospective study on the potential of these sustainable aviation fuels production pathways in France. Based on this work, the French Ministries of Transport and Ecology and Sustainable Development have defined a national roadmap for the deployment of sustainable aviation fuels. This roadmap, developed as part of the *Assises du transport aérien*, clarifies France's ambition and strategy for deploying sustainable aviation fuels by 2020. Through five fundamental principles and a deployment path, it sets the framework for the remaining actions and will be followed by work to define the necessary public policy tools to achieve these objectives. However, the deployment of these products should not be promoted in France only. *“Given the higher cost of sustainable aviation fuels compared to conventional aviation fuels, coordination at European and international level is essential to avoid problems of distortion of competition between the various air transport stakeholders”*, stressed Claire Rais Assa, Project Manager at the Sustainable Development Division of the ATD⁴. Research development, knowledge sharing, and partnerships: deployment of sustainable aviation fuels comes at this price. ●

1. Farnesane, a biofuel derived from the fermentation of cane sugar.
2. This is a partnership between the French Ministries of Ecology and Sustainable Development, Transport, Economy and Finance, Airbus, Safran, Air France, Suez, and Total.
3. French National Energy Research Alliance.
4. Air Transport Directorate.

Viewpoint



CLAIRE RAIS ASSA,
PROJECT MANAGER
AT THE SUSTAINABLE
DEVELOPMENT DIVISION
OF THE ATD

Recycling waste, agricultural or forestry residues, converting used oils... In all, six aviation biofuel production pathways are now technically certified, and others are in the process of being certified. It is estimated that some of these production pathways could help reduce CO₂ emissions by up to 90%.”

AERONAUTICAL INDUSTRY

- 15 A new action plan fostering aviation industry competitiveness
- 17 Civilian UAV use is maturing
- 19 French council for air transport cybersecurity: France shows the way
- 20 Thales: focus on connectivity and autonomy

A new action plan fostering aviation industry competitiveness

The Aviation Industry Strategic Committee, the French government, and the Association of French Regions adopted an action plan last December to improve SME competitiveness, international performance, and help SMEs attract the skills they need.

BY **Henri Cormier**



An extremely ambitious action plan, both in terms of its content and in the number of companies involved and the resulting cooperation within the industry” was how Jean-Michel

Poulier, Director of Industrial Affairs of the French Aerospace Industries Association (GIFAS), described the new aviation industry’s strategic action plan. Adopted on 10 December, this action plan is intended to allow the various stakeholders to share a common vision, thereby improving the competitiveness of this eminently strategic industry. With its four hundred members representing a turnover of 65 billion euros in 2018, the stakes are high for GIFAS. To achieve this, this new strategic action plan is based on three structuring actions. The flagship action, the *Industry of the Future* programme, will be launched at the Paris Air Show. It follows on from the *Industrial Performance* programme which focused on optimising existing production facilities

to meet the immediate issue of increasing production rates. *Industry of the future* is intended to modernise production facilities to face the emergence of international competitors which have the competitive edge of being created with organisation

195,000
THE TOTAL NUMBER
OF EMPLOYEES OF
GIFAS MEMBER
COMPANIES

methods and production equipment based on new digital technologies. As such, this first area of the action plan aims to individually help some 300 SMEs and mid-cap companies implement *4.0 solutions* while increasing the collective efficiency of the supply chain through the deployment of cross-company tools. *“In terms of competitiveness, each SME needs to be individually supported to acquire technological tools, and actions focused on collective performance also need to be implemented. As such, we will be stepping up the use of the Air Supply collaborative platform dedicated to logistics data exchange and offer SMEs the tools they need to improve their maturity in cybersecurity”*, stresses Jean-Michel Poulier. ●●●



© Cyril Abad / Agence CAPA Pictures

→ Attractiveness

Meeting the challenge of employment and skills

How can more talent be attracted to the aviation industry? This is the question that the industry's SMEs regularly ask themselves. Thanks to the actions carried out in recent years by GIFAS, the aviation industry currently has some 7,000 apprentices in its workforce (apprenticeship and professional training contracts). The fact remains that SMEs, which mainly offer production jobs, are struggling to recruit and retain young people. The collective initiative launched in late 2018 in the form of a Commitment to developing jobs and skills (EDEC) aims to help SMEs overcome these difficulties. Concluded between the French government, the branch, and the industry, this EDEC is intended to better identify the skills needed by SMEs, develop innovative training tools, and improve cooperation between the industry and professional training bodies. Additive manufacturing, augmented reality, robotics¹, Big Data, etc., the EDEC also aims to support SMEs in implementing a recruitment and training policy that will allow them to accelerate their transformation towards the aviation industry of the future. The French government and the industry have also pledged to finance this action up to 2 million euros and to increase by 50% the number of apprentices in five years.

1. Use of collaborative robots. This involves associating, in real time, the capacities of a robot (strength, precision, repetition, etc.) with the specific skillset of a human being.

●●● IMPROVE SME EXPORT RATES

Employment and skills are the second area of the aviation industry's action plan. This is an equally important issue for this industry which hires 15,000 people per year but, like many industrial sectors, lacks attractiveness, especially among its SMEs. The measures adopted as part of this new roadmap therefore aim to better inform training and employment stakeholders on developments in aeronautical professions and to support SMEs in their training and recruitment policy (see box).

Finally, the third area focuses on the need to improve export support for SMEs. While the industry, as a whole, generates 85% of its turnover abroad, the average export rate of SMEs is just 27%. The industry intends to create the conditions for better coordination of the actions carried out by GIFAS, aeronautics clusters, and other stakeholders involved (Bpifrance, Business France, Regions). *"For an SME like ours, it is important to be able to rely on the action of an industry strategic committee to ensure clear communication of major contractors' expectations and to anticipate our actions abroad"*, explains Clémentine Gallet, co-founder of Coriolis Composites. This former start-up currently generates 75% of its turnover from export. ●

Civilian UAV use is maturing

Since its creation in 2015, the French Drone Council has conducted many studies and experiments and is now continuing to work on new uses: long range operations, 'on own account' operations, and urban logistics. Explanation.



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Created in 2015, the French Civil Drones Council (CDC) aims to accelerate the development of UAVs by establishing dialogue between all the stakeholders.

It has carried out a number of projects to develop the use of these unmanned aerial vehicles for professional uses since it was created. Among the CDC's work, long range operations (LRO) cover a major issue: they must allow operators to fly their UAVs over great distances (several hundred kilometres) at a maximum altitude of 150 metres, including above populated areas - this may include, for example, following a rail or a power line network for inspection.

ADAPTED SCENARIOS

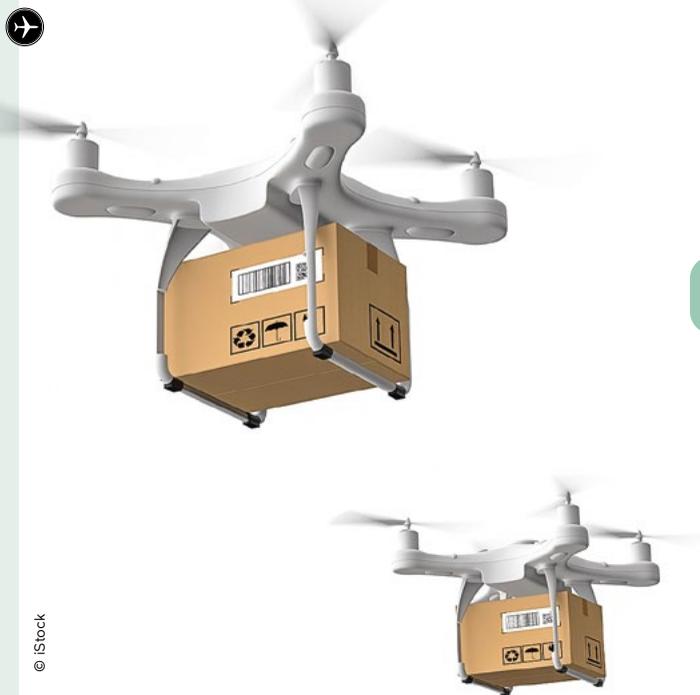
"The CDC's LRO working group has been created to meet the needs expressed by major contractors and covers two timelines: short-term (interim) and long-term action", explained Séverine Charmant, CDC project manager at the Aeronautic industry department of the Air Transport Directorate. "The studies and works conducted by the CDC aim at developing a reli-

able safety methodology, based on aeronautical standards, to allow authorisations that are more extensive than those normally granted by the DSAC (French civil aviation safety directorate) to be issued. Short-term LRO work is based on a safety analysis by ONERA¹ with several UAVs chosen for their maturity and scaled for this type of activity. This made it possible to issue, at the end of 2018, a first specific authorisation which goes beyond the scenarios covered by the regulations. Although this is a success, it does not yet fully meet the working group's ambition which will require long-term action as evidenced by the launch of a multi-year R&D study, financed by the DGAC (French Civil Aviation Authority), intended to develop safe avionics functions with the demonstration of the level of safety achieved by UAVs. This is necessary for complete LROs."

The European Aviation Safety Agency (EASA) is keeping tabs on these experiments, and it was informed of the first results obtained in February 2019.

RECOGNITION OF A PROFESSION

Another area of the work in progress concerns urban logistics. The aim is to study the conditions ●●●



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- under which transport UAVs may be used over residential areas, taking safety and acceptability constraints into account.

Finally, a Training Committee has been created, following a request from the French Professional Federation of Civil Drones (FPDC) which carried out “*work for the recognition of the profession of remote pilot in the French Labour Law with particular attention to making possible the creation of a certificate of professional qualification*”, said Séverine Charmant. The FPDC’s initiative aims to use the CDC’s ability to bring together industry stakeholders to develop complementary training units adapted to the needs of the profession.

While aeronautical training is already provided for in French regulations for leisure remote pilots and another for professionals, the CDC’s work exclusively focuses on professional use. “*The idea is to go further in the recognition of the profession of remote pilot.*” UAVs are effectively used in various professions, such as aerial photography, for different purposes. However, “*It is not enough to know how to pilot a UAV safely, you also need to know how to use these skills in a profession*”, concluded the CDC Project Manager. ●

1. French national aerospace research centre.



Two questions to



BERTRAND HURON,
DEPUTY HEAD OF THE CIVIL AVIATION
PERSONNEL DIVISION AT THE FRENCH
CIVIL AVIATION SAFETY DIRECTORATE.

To be inspired by the French regulatory system

What are the main directions of the future European regulations on UAVs?

Initially, there will be two regulations. The first is an implementing act that organises operations into three categories depending on their level of risk for third parties. The “open” category will be used for leisure and professional activities carried out in visual line of sight (VLOS) and at a maximum flying height of 120m. The specific category will mainly include more complex professional operations, such as beyond visual line of sight (BVLOS) operations, and, finally, the certified category will target drone operations that are similar to those used for manned aviation, such as passengers or freight transport. The second text is a delegated act which supplements the open category by setting the technical requirements of drones through CE marking. These texts will then be subsequently supplemented by a U-Space regulation addressing drone traffic management.

The continuous involvement of the DSAC in the European Aviation Safety Agency’s regulatory work has allowed the European system to be inspired by the French regulation regarding remote pilot training and operational scenarios for professionals activities. One of the main differences lies in the distinction between leisure and professional activities, which disappears in EU regulations which is a risk based.

When will the European regulations come into force?

The delegated act is expected to be adopted in the first half of 2019, for entry into force upon publication to allow the stakeholders set up the CE marking system. The implementing act provides for a transition period of one to three years to give the Member States that have regulated this activity time to adapt their national regulatory framework.

French council for air transport cybersecurity: France shows the way



“Cybersecurity is a sensitive issue on which we are actively working in close cooperation with the entire ecosystem, including the DGAC, government agencies and airlines, and we are following ANSSI’s recommendations to improve our level of protection.”

GILLES LÉVÊQUE,
INFORMATION SYSTEMS DIRECTOR,
ADP GROUP.

Partnership body created in spring 2018, the French Council for Air Transport Cybersecurity (CCTA) is a benchmark for supervising, structuring, and coordinating cybersecurity initiatives in the French aviation sector because operator interfaces may be sources of vulnerability.

BY **Olivier Constant**

As in many other business sectors, connected and interconnected systems have strongly developed in air transport, both on board aircraft and in airports. These interconnected systems, which are ubiquitous in aviation safety and navigation as well as airport security and operation, have the advantage of being able to manage the flow of increasingly heavy traffic. However, this digital evolution can reveal vulnerabilities; as such cybersecurity has become a fundamental issue for the performance and development of air transport.

CONSOLIDATE FRANCE’S WEIGHT WITH THE CCTA

This is why the International Civil Aviation Organisation (ICAO) has taken up this issue with a comprehensive approach that aims to establish international rules. This was reflected in France’s adoption of resolution A39/19 on *Civil Aviation Cybersecurity* in October 2016.

ICAO’s increasing work in this area has led France to create a dedicated body: the French council for air transport cybersecurity (CCTA). This council is intended to enable our country to have more influence on the decisions that will be taken within ICAO which will subsequently become international standards. The council’s work is part of the cybersecurity policy, led by the French Network and Information Security Agency (ANSSI) and governed by the French Military Planning Law. This policy aims to deploy and organ-

ise the necessary means to maintain the information systems of Operators of Vital Importance (OIVs) at their best level of availability, integrity, confidentiality, and traceability.

The CCTA includes three types of entities (public administration, manufacturers/suppliers, and airlines/airports) and is chaired by Patrick Gandil, Director of the DGAC (French Civil Aviation Authority). At its last meeting, in November 2018, “*work on the methodology was almost completed, and information flows were mapped. The next meeting is planned for mid-May 2019. One of its tasks will be to develop hypothetical scenarios of potential attacks for members to work on*”, explained Guillaume Counio, Cybersecurity Project Manager at the Aeronautical Construction Division of the Air Transport Department.

COMMON WORK

Even if France has not been targeted by a cyber-attack to date, it must be prepared for this eventuality. Any attack that could potentially be made on operator interfaces must be able to be countered. As such, it is not a surprise that, in these circumstances, the ADP Group confirmed, through its Information Systems Director, Gilles Lévêque, that “*we are actively working on this subject with the entire ecosystem, including the DGAC, government agencies, and airlines, and we are following ANSSI’s recommendations to improve our level of protection.*”

A collective approach is really the only solution to effectively apprehend this threat. This group work has been entrusted to the CCTA in charge of leading air transport cyber resilience. ●



Thales: focus on connectivity and autonomy

For the European leader in avionics, connectivity and system autonomy are key challenges for the future of aviation. These challenges are addressed in a very collaborative way within CORAC (French Council for Civil Aviation Research).

BY **Henri Cormier**

With its avionics platforms and functions, sensors and data fusion techniques, human-machine interfaces, pilot assistance functions, cybersecurity solutions, and other developments, Thales is stepping up its efforts to develop increasingly connected and autonomous aircraft. In particular, the world's third largest avionics equipment manufacturer coordinated CORAC's research work on second-generation embedded computing platforms (post-A350) designed to support the new generation of functions in the areas of trajectory assistance, mission management, or systems management. Supported by the French *Investments for the Future Programme*, this project focused on defining and validating the architecture and building blocks of these new platforms. Forming the backbone of the digital aircraft of the future, they make it possible to achieve ambitious objectives, such as increasing by half the application hosting capacity,

substantially reducing mass, and improving data exchange security. This technological success has been made possible by an exemplary collaborative approach within CORAC "Airbus, Airbus Helicopters, and Dassault Aviation as well as almost the entire supply chain involved worked together on this project. The aircraft manufacturers first agreed on the expression of common needs which then allowed avionics equipment manufacturers and systems integrators to design widely shared solutions", says Bertrand Larrieu, Director of Studies at Thales AVS.

PAVING THE WAY TO MORE AUTONOMOUS AIRCRAFT

Building on this first success, Thales is continuing to work with aircraft manufacturers under CORAC to develop a new generation of smart and ergonomic cockpits, with the aim of making piloting easier and reducing crew workload. Thales is also seeking to improve aircraft connectivity for seamless communication between aircraft and with the ground, as well as an extensive use of open world resources in a cyber-secure environment. Is this the first step towards pilotless aircraft? Although the technological bricks exist for this, a fully autonomous aircraft is not on the cards yet. "We mustn't be too ambitious" says Solly Side, Vice President for Institutional and European Affairs at Thales. "Aircraft manufacturers need to begin to study the possibilities; Thales is just a link in the chain. Beyond technical feasibility, aeronautical certification procedures need to be reviewed for this project, and there is also the issue of passenger acceptance. We are currently working on flight calculators, avionics systems, and the certification processes that will need to be implemented, always with safety as a priority. Moreover, with regards to pilot shortages and increasing air traffic, Thales can provide part of the solution through its cockpits of the future which are increasingly intuitive and help reduce pilot training time." ●



Viewpoint



AYMERIC DE LOUBENS,
HEAD OF THE RESEARCH POLICY
OFFICE AT THE AVIATION INDUSTRY
DEPARTMENT OF THE DTA (FRENCH AIR
TRANSPORT DIRECTORATE)

Thales plays a central role in CORAC's research work on connectivity and autonomy. Thales fosters the convergence of aircraft manufacturers' needs and builds a use-based vision with them. Thales also shares the key elements of its strategy on emerging topics, such as UAVs and artificial intelligence. The joint action of Thales and the other CORAC members in this area will naturally extend at European level when launching major demonstrations on the new uses of airspace will be required."

AIR TRANSPORT

22
DSNA invests
in SESAR

24
Remote control of aircraft
at an aerodrome

25
Roissy-CDG and Le Bourget:
fields of innovation

26
The H160: a concentrate
of applied technology

27
A300B... with B as in
Bourget!

28
"Security Vision": partnering
toward improvement

DSNA invests in SESAR

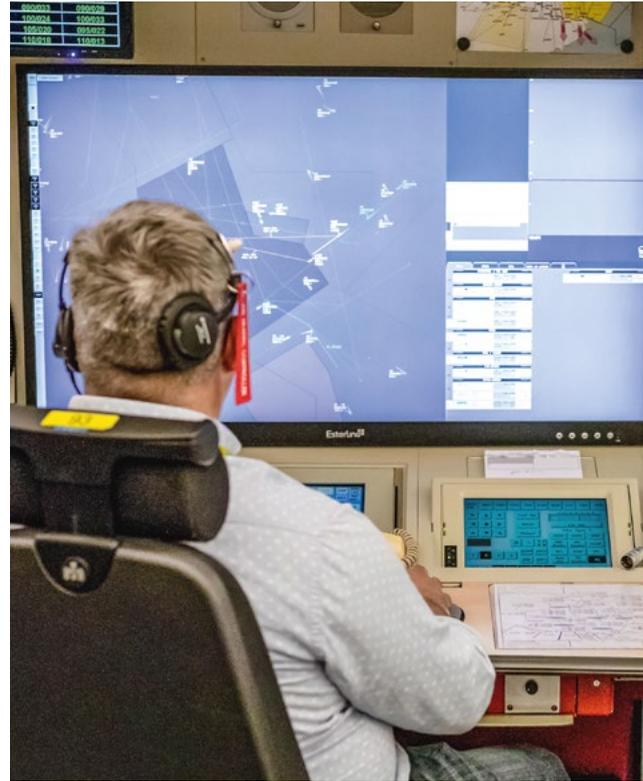
Highly involved in the Single European Sky research and development programme, DSNA conducts testing and assessments. These projects contribute to the global modernisation of air-traffic control.

BY **François Blanc**

The technological component in the construction of the Single European Sky, the SESAR¹ programme has targeted, since 2005, four fundamental objectives: improving the safety of air navigation, optimising airspace capacity, reducing environmental impact and reducing the costs of air traffic management. *“Definition studies were launched from the very start of SESAR. The two broad orientations that emerged at that time, were flight path management in four dimensions and the sharing of information, called SWIM (System Wide Information Management). These broad guidelines have remained the main focus of the research and implementation of solutions deriving from SESAR,”* says Patrick Souchu, SESAR program director at DSNA (French Air Navigation Services Directorate).

25 R&D PROJECTS ACTIVE IN 2019

In line with the priorities dictated by the latest state of the economy or high expectations from air carriers, the pursuit of the SESAR objectives has evolved accordingly. *“Following the slowdown in traffic and the rising price of oil observed from 2010 onwards, costs reduction for airline companies has become a more pressing issue, for example. Yet in the past two years, with the upturn in traffic growth, optimising airspace capacity has again taken centre stage.”*



Concluded at the end of 2016, the first R&D phase of SESAR gave rise to a catalogue of 60 or so innovative solutions. Since then, a second phase, designated SESAR 2020, has made it possible to launch *“... a first wave of projects, DSNA participates to 25 of them. A call for tender for a second wave was issued in January 2019, for a scheduled start up in late 2019 of the R&D activity, stretching into 2022.”* In parallel, the deployment of SESAR, today underway, was the subject of a European regulation in 2014: the Pilot Common Project (PCP), which imposes the implementation of six broad functionalities deriving from the work of the first R&D phase, and partially from SESAR 2020.

DSNA DEMONSTRATIONS

In this context, DSNA has taken in charge a few demonstration projects with actual traffic. These projects relate, for example, to optimising the sequencing of aircraft arrivals at their destination (XStream), or optimising flight plans filed by airlines at certain times of heavy traffic congestion (CAP: Collaborative Advanced Planning), con-



© DSNA

ducted in collaboration with the air carriers, the network manager in Brussels and other European providers of air navigation services. The concept of interoperability is also part of current developments. *“It’s about defragmenting the European airspace by generating a common vision of every flight, updated continuously,”* explains Patrick Souchu.

DSNA also plays a driving role in the SAFE (Safer Airports and Flights for Europe) project, which: *“... aims to reinforce the safety of airports, in particular through improving alerts and ground guidance functions.”* Lastly, it is conducting studies for the integration of drones in the controlled air space. The CORUS project and the PODIUM and USIS demonstrations currently under preparation are also part of the work involving this particular type of traffic. *“With the growing number of these aircraft, drones are assuming increasing importance,”* concludes DSNA SESAR program director. ●

1. Single European Sky ATM (Air Traffic Management) Research.



Three questions to



PATRICK SOUCHU,
SESAR PROGRAMME DIRECTOR
AT DSNA

Contribute to a more flexible, more open European airspace

Why did the European Commission launch a study into the architecture of the European airspace?

Today, the demand for European airspace capacity is high. Capacity gains are possible once you eliminate border limitations and you encourage more flexible airspace management. Furthermore, this study is also a response to the findings of the European Court of Auditors with regard to the efficiency of the Single European Sky.

What are the components of this?

This study was assigned to the SESAR-Joint Undertaking, which examined how the SESAR solutions could contribute to a more flexible, more open European airspace, and enabling a move toward a greater range of services, hence the treatment of topics such as “free route airspace” - without border constraints -, interoperability, service virtualisation, data service supply, automation, and capacity on demand. This should give rise to an airspace reconfiguration study, then, ultimately, a regulatory framework designed to encourage the development and implementation of the necessary innovative technologies.

What are the challenges associated with this architecture for the future?

They are first of all of an organisational nature, since they concern the European and State authorities, the air navigation services providers, and the military. They also relate to the particular professions: the idea being to culminate in air-traffic controller qualifications enabling this objective of enhanced flexibility to be attained while being less dependent on geographical space and maintaining high requirements in terms of safety. Lastly, there are also challenges with regard to the supply of data management services and system operations.



Remote control of aircraft at an aerodrome

In a control tower, air-traffic controllers can now enhance their vision of the aerodrome's traffic or manage a remote location thanks to high-definition images captured by high-performance digital cameras. This is what is called a DAT, or digital advanced tower, a generic term adopted by DSNA for this innovative technique which offers many benefits.

BY **Germain Chambost**

In their control tower, an air-traffic controller who is "on watch" (an expression inherited from the seafaring world) monitors and manages by sight, or via binoculars, the movements of aircraft and ground vehicles on the platform for which they are responsible. The controller therefore needs to be sufficiently elevated to have a panoramic view of the platform and be able to monitor visually the taxiing aircraft, take-offs and landings. To cater to this need for a good view of the actual traffic on the platform, DSNA envisages equipping certain aerodromes with a new visualisation system: the DAT or *digital advanced tower*. Air-traffic controllers can therefore benefit from new functionalities, or even control certain aerodromes remotely.

RELIABLE AND COMPETITIVE ASSEMBLIES

Progress made in the performance and reliability of modern visualisation, image capture and calculation systems now enable controllers on watch to benefit from "video walls", with the images supplied by the high-definition cameras disposed in batteries on raised supports. *"The cost of such assemblies today makes them competitive when compared to building a conventional control tower, when the question of providing a platform with such a tower arises, or for providing new tools for air-traffic controllers,"* explains Antoine Martin, DAT program director at DSNA. *"The video walls in question can be used as media for communicating other information concerning the traffic, such as the "callsign" of the aircraft, or else equipped with complementary functions, such as systems capable of detecting intruders on the platform concerned."*

EUROPE AT THE CUTTING-EDGE

In the search for alternative solutions to the traditional control tower with controllers physically present on the platform, Europe is at the vanguard. The Swedish, Norwegians, Germans, Hungarians, French and British have all been pursuing for several years their own testing that has given rise to exemplary solutions. In Sweden, small airports have in this way been equipped with remote traffic control. Another example is the control tower at London City airport, nestled in the very heart of London, and which will be relocated some 130 km away and controlled remotely, thereby freeing up space on the site for the airport extension. In France, the case of Saint-Pierre and Miquelon is also noteworthy. Miquelon, a low-traffic platform, is equipped with an AFIS service providing basic information to aircraft, but no actual control. Aircraft movements, which are non-intense but strategically important for supplying the island, could therefore also be managed from Saint-Pierre. Another case is that of Quai du Large, a busy helicopter platform 5 km from Cannes airport, which will be managed directly by the control tower at Cannes. Lastly, the air-traffic control for the Tours Val de Loire aerodrome, due to be terminated by the French Air Force in 2021, will be transferred to the civil air-traffic controllers of the DGAC, with the aid of the DAT, on one of its remote operational centres. So many cases, so many solutions to adapt... and adopt! ●

12

FEASIBILITY STUDIES FOR DAT PROJECTS HAVE BEEN CONDUCTED BY DSNA.

6

PROJECTS HAVE BEEN CHOSEN: ORLY, BORDEAUX, SAINT-PIERRE-AND-MIQUELON, PYRENEES (PAU AND TARBES), QUAI DU LARGE AND TOURS VAL DE LOIRE.

In 2017, THE DAT AT ORLY CAME INTO SERVICE (SAVA PROJECT).

Roissy-CDG and Le Bourget: fields of innovation

To improve still further air traffic management on the Roissy-CDG and Le Bourget platforms, several solutions conceived in the framework of SESAR¹, the technological component of the “European Single Sky”, have been - or are to be - deployed.

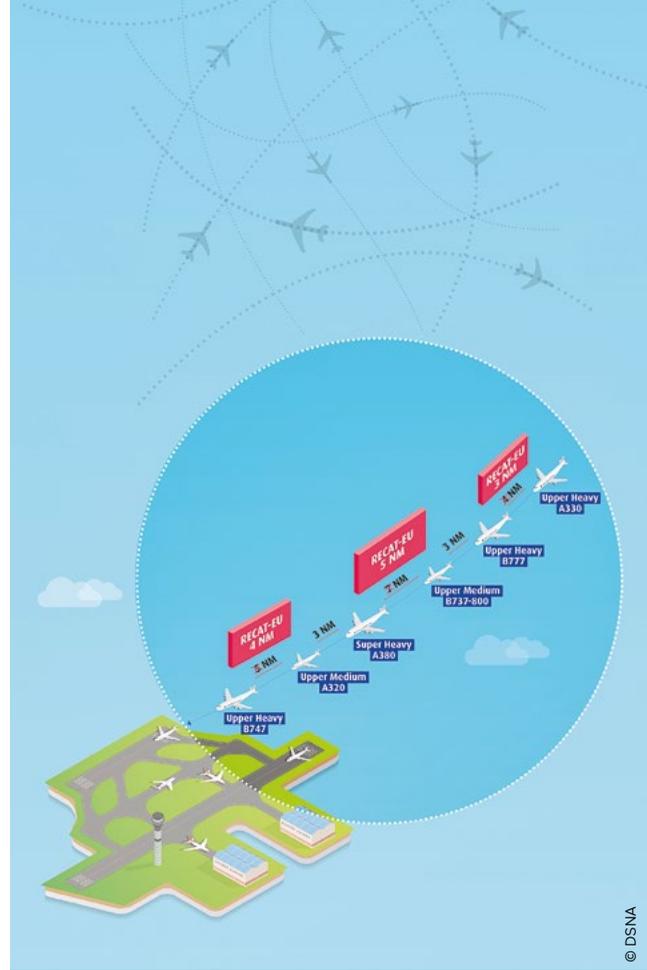
BY Germain Chambost



Security, environment, operational performance: these are, in this order, the three concepts on which we will be concentrating our efforts to improve the services of DSNA² on the Roissy-Charles de Gaulle and Le Bourget platforms,” says Chems Chkioua, head of the control center that manages the sites in question. He goes on to specify: *“Operational performance necessarily follows on from the efficiency of the first two concepts. Yet improvements are difficult to achieve as the statistics reflecting these concepts are already very good. Furthermore, we need to take action on systems that have sometimes been in place for years. We therefore move forward step by step, to introduce real innovations on a continuous basis, and which deliver value for the community, without waiting for the headline events that constitute the generational changes to our technical systems, and which occur every twenty years.”*

INNOVATIONS STILL LIKELY TO EVOLVE

RWSL, RunWay Status Lights, a detection system for runway incursions, was introduced for the first time in Europe in 2017 at CDG, on the two parallel runways. Automatic, independent of air-traffic control, it supplements the know-how and vigilance of the controllers. *“It offers an extra safety net,”* Chems Chkioua points out. This innovative system is therefore likely to evolve. It could be adapted to detect disruptive devices such as drones, a new threat. This progressive evolution also concerns RECAT EU³. This involves more precisely specifying the sensitivity of aircraft to wake turbulence according to their mass, and adapting the separation distance between them accordingly, on final approach to the airport. RECAT



© DSNA

EU was deployed for the first time in Europe at Roissy-CDG and Le Bourget on 22 March 2016. While this has required a fairly in-depth upgrade of ATC working methods, it has resulted in particular in an improved “throughput” of aircraft in the approach phase. *“We are working on implementing this concept on the take-off phase,”* says Chems Chkioua, *“but we mustn’t spread ourselves too thinly, so that the calendar for introducing innovations remains sustainable in both human and technical terms. Let us not forget that the performance of the system depends above all on the know-how and commitment of the staff.”* Precision satellite approaches have, for their part, helped mitigate the unavailability of serviced ILS. They have also opened up new night approach flight paths. This led to DSNA bringing into service, on 16 September 2016, continuous descent operations for night flights (00:30-05:00, local time). It allows to reduce dramatically the noise on the approach flight paths. This constitutes an innovative concept that is truly implemented in every day operations. This is why it is real improvement for local residents. Next step: extending the concept beyond the dead of night, despite traffic being far more complex to manage. ●

1. Single European Sky Air traffic management Research.
2. Direction des Services de la Navigation Aérienne (Air Navigation Services Directorate).
3. “Categorisation of aircraft in Europe”: aircraft are classified into six categories (instead of the previous four), according to their mass and wingspan, which characterise the wake vortex they generate, which can disturb the flight of the aircraft in their wake; and according to the “resistance” to this disturbance of the aircraft trailing in this wake (see Aviation Civile No. 378, p. 22).

The H160: a concentrate of applied technology

Airbus Helicopters' H160, which received support from the DGAC since 2012, is a concentrate of several innovative technical solutions. As the designated successor of the Dauphin helicopter family, it is also expected to conquer new market shares.

BY **François Blanc**



©DR

→ Support

A programme supported by the DGAC

DGAC's support for the H160 programme was formalised by a repayable advance agreement signed in 2012 between Airbus Helicopters and the DGAC. "The goal is to share the risk generated by the development of the aircraft between the manufacturer and the State. Airbus Helicopters will progressively repay this advance as it proceeds with deliveries" explains Cyril de Mesmay. Prior to this agreement, "... the DGAC had supported several research projects, including those that enabled the development of the Blue Edge™ rotor blades."

Airbus Helicopters' H160 is a brand-new rotary-wing aircraft designed to strengthen the European manufacturer's presence in the civilian market for medium-sized aircraft.

With its 5,670 kg maximum take-off weight and its modular interior configuration, it is designed for several uses: oil and gas personnel transportation, search and rescue, emergency medical evacuation and VIP transport. It is intended to replace the Dauphin helicopter family (1,104 aircraft produced by the end of 2018, with 823 still in service worldwide), but also to gain new market shares in competition with the likes of Leonardo's AW139 and AW169. In the current Airbus Helicopters range, it fills in the gap between the H145 and the H175 twin-engine helicopters and thus completes the manufacturer's offer on a strategic segment.

IMPROVED PERFORMANCE

The H160 incorporates several technical innovations. "Its main rotor is the result of a partnership between Airbus Helicopters and Onera¹, with support from the DGAC. It reduces the sound signature of the aircraft by 50% and increases its payload by about 100 kg compared to a conventional rotor of the same size," says Cyril de Mesmay, head of the office for Aeronautics programs at the Aeronautics industry department of the DTA (French Air Transport Directorate). Its fenestron-type streamlined tail rotor has already

equipped several helicopter models coming out of the manufacturer's production lines. Inclined at a 12° angle, the H160's tail rotor improves the stationary flight performance of the aircraft. The biplane-type aft tail provides better stability at low speeds and the all-composite fuselage generates significant weight savings. The landing gear, operated through electric power, also contributes to weight savings and easier maintenance. The Helionix avionics suite, along with the digital-based predictive maintenance concept designed to increase the aircraft's availability, both confirm its cutting-edge positioning on the market.

ASSEMBLED FIVE TIMES FASTER

Airbus Helicopters is taking advantage of the launch of its latest product to inaugurate a new industrial process: "The various subassemblies manufactured in France, Germany and Spain are integrated within the final assembly line in Marignane (Bouches-du-Rhône), itself organised into five successive stations. Each station will have eight days to complete its assembly cycle, which means the H160 will be assembled in just 40 days: nearly five times faster than a Dauphin helicopter," explains the head of the office for Aeronautics programs. Expected at the end of the year, the certification of the H160 will shortly precede the delivery of the first aircraft. ●

1. Office national d'études et de recherches aérospatiales (French national aerospace research centre).

A300B...

with B as in Bourget!

Unveiled 50 years ago at the Paris Air Show in Le Bourget, in a favourable political and economic context, the A300B remains one of the best examples of industrial cooperation in Europe.

BY **Frédéric Magnan**

It was inside the fuselage of an Airbus A300B that the French Minister of Transport, Jean Chamant, and the German Minister of Economy and Finance, Karl Schiller, signed the intergovernmental agreement on the production of the first Airbus, on 29 May 1969 at the Paris Air Show. It was as yet only a fuselage mockup, but the speed with which the agreement was drafted and signed, in the space of two months, demonstrated that the political and industrial will was really there.

A PEACEFUL RAPPROCHEMENT

The adventure began three years earlier, in May 1966, when the French and British transport ministers expressed their intention to launch an aeronautical industry cooperation programme. Germany joined the duo several months later, and in September 1967

the protocol combining the technical, economic, financial and commercial elements of the project constituted the first foundation stone of the European aircraft. The time was ripe for this kind of challenge. Politically, the EEC was gradually taking shape, and the Elysée treaty of January 1963 underpinned the joint desire of France and Germany to work toward peacetime rapprochement. In terms of air transport, traffic worldwide was growing



© Richard METZGER / DGAC - STAC

in the order of 15% per annum. Lastly, a new generation of turbojets was offering a 20% reduction in fuel consumption. Although the British government decided to withdraw from the agreement in spring 1969, when a Rolls-Royce engine was rejected in favour of the CF6-50 from General Electric, a British industrial partner, HSA (Hawker Siddeley Aviation), remained on board in a private capacity, alongside Sud-Aviation for France and Deutsche Airbus for Germany. With “A” for Airbus, 3 for the number of partners, and 300 for the number of seats originally envisaged, the A300 drew its name from these characteristics. The “B” was added in summer 1968 when an alternative 250-seater aircraft was required to match the actual capacity of the engines.

FROM FIRST FLIGHTS TO FIRST ORDERS

In December 1970, the Airbus Industrie consortium, responsible for the prime contracting and commercialisation of the future aircraft, was created. Representatives of the industry, present from the start, were placed at the helm: Henri Ziegler, CEO of the new Aérospatiale (SNIAS) entity, its first managing director; Roger Béteille (Aérospatiale), for technical management; and the German Felix Kracht (Deutsche Airbus), in charge of production, in particular. The first flight of the Airbus A300B1 took place two years later. Spain then joined the consortium. Air France was the company that launched the aircraft, with the first commercial flight on 23 May 1974, between Paris and London. The 1974 crisis, which brought in its wake a drop in air traffic, marked an inauspicious start to the first commercial steps for Airbus. Yet the qualities of the aircraft and its technical lead in the medium-haul sector, compared to its main competitors, led by Boeing, would guarantee the success of the Airbus A300B and its successors (821 aircraft manufactured). ●

AIRBUS DATES:

- 20 September 1967: signing of a tripartite protocol between Germany, France and the UK, which officially launched the Airbus project definition phase.
- 29 May 1969: Franco-German agreement on the production of the Airbus A300B.
- 18 December 1970: Creation of Airbus Industrie (consortium).
- 28 October 1972: First flight of the Airbus A300B1.



« Vision Sûreté » (“Security Vision”): partnering toward improvement

Improving - overhauling even - the security procedures so as to ensure the consistency and efficiency of the system while controlling costs: this is the objective of the national « Vision Sûreté » innovation programme, launched in 2014 by the DGAC. Following the positive outcome of the first phase, the programme is today entering its second phase, with the implementation of fresh trials. Here are the details.

BY Sylvie Mignard

Faced with the continuous increase in air traffic and the persistent terrorist threat, all airports face the same question: how to absorb the extra passenger numbers while benefiting from robust security measures. This is the context in which, in 2014, the national “Vision Sûreté” (“Security Vision”) innovation programme was implemented. The objective is to improve the quality of security checks for passengers and their cabin baggage. “This initiative is based on a collaborative approach,” say Frédérique Gely, deputy sub-director for security and defence, and Julien Levet, head of the civil aviation security measures office at the DTA¹. “The idea was to work in partnership with the various stakeholders in the aviation sector, as they are familiar with the terrain and the specifics that go with it.” Twenty or so trials have therefore been put in place with five partner airports.



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TESTING NEW EQUIPMENT ON THE GROUND

“We wanted to trial solutions that addressed security imperatives while improving passenger comfort,” Julien Levet goes on to say. Among the equipment tested, a shoe analyser, for example, enables explosives to be detected without passengers having to take off their shoes. A multiplexed security checkpoint is also being tested with the purpose of providing remote examination of images away from the checkpoint, and therefore improving by the same token the working conditions of security agents. Likewise, a body scanner enables targeted frisking of a passenger to be carried out when an alarm is triggered in the inspection gate. This helps limit this operation, which is often experienced as intrusive. “Beyond equipments, it is an entire process that is being reinvented,” explains Jacques Le Stanc,



→ Tool

Flight crew identification facilitated by biometric CMC

Identifying yourself before accessing an airport security zone is an obligation for crew members. Henceforth, they will be able to use a biometric CMC (Crew Member Certificate). More secure, this document, produced in partnership with the National Printing Office (Imprimerie Nationale), includes biometric data making identity theft impossible. The biometric CMC, initially proposed to Air France cabin crew, will be extended to other volunteer airlines. It will help streamline the passage of crew members through security.

public safety and security director of the Aéroports de Paris (ADP) Group. *“We’ve been able to test the new security checkpoint line and its equipment in thoroughly operational conditions. This has allowed us, internally, to decide to deploy this type of mechanism on all the new infrastructures, and therefore reserve the space required for implementing them. Furthermore, we are also studying the suitability of deploying this equipment on the older infrastructures.”*

EXPANDING THE TESTING TO THE ENTIRE SECURITY CHAIN

In light of the positive results from phase 1, a second phase was launched in April 2018 to work on the entire security chain, in particular the security checks of cabin baggage, as well as of hold baggage,

freight and mail. All the parties involved will therefore continue to trial innovative equipment or processes on the ground. An example of this is an automatic detector of explosives in cabin baggage. *“We have already started testing this mechanism,”* says Jacques Le Stanc. *“In this way we been able to draw the attention of its manufacturers to false alarms.”* He then adds: *“This creates a virtuous cycle, enabling better integration of the operational problems in the development of equipment. As in phase 1, the various trials put in place may be rolled out more extensively, or we may decide to have the equipment recognised through European regulations,”* Mr Levet concludes: *“This is indeed the case today for the detector of explosives in shoes.”* ●

1. French Air Transport Directorate.

INTERNATIONAL COOPERATION

- 31 A Single Sky for Africa
- 33 France keeps on with its cooperation with Eastern Europe and the Balkans
- 34 European twinning: a tool to promote convergence
- 35 The Indian Ocean rises to the security challenge
- 36 Flawless support for industrial exports
- 37 ENAC helps promote French know-how worldwide
- 39 A new heading for DSNA Services

A Single Sky for Africa

The deployment of an African Single Sky will underpin the opening of the single market for air transport in Africa, to face up to the forecast growth in air traffic. The DGAC will support ASECNA in this programme, which aims to further improve safety and performance and reduce greenhouse gas emissions.

BY Germain Chambost

To date, 26 of the 54 countries in the African Union have signed up to the agreement of January 2018 planning for the establishment of a single African air transport market by 2063. The signatories have undertaken to eliminate the current restrictions that exist between the African nations and which impede exchanges, to the detriment of trade, industry and tourism. These are all activities that create jobs on the continent. Both freight and passenger traffic is set to increase strongly over the coming years, whereas it currently only represents 3% of world traffic.

In this context, the establishment of a Single Sky, the African counterpart to the European Single Sky, becomes binding on all air navigation service providers, to offer a greater airspace continuum (between flight levels 245 and 660), with increasingly safe and efficient air-traffic control services. This is the case for ASECNA¹, which comprises 17 African nations and France, and which provides navigation and associated services (aeronautical information, meteorology, fire services, etc.) and manages the organisation of the airspace over a total area of 16 million square kilometres (one-and-a-half times the size of Europe), spread over six flight information regions (FIR). In light of this, Mohamed Moussa, Director-General of ASECNA, wanted therefore to put in place a “Single Sky for Africa” programme, and trained a dedicated team. This programme complies with the Global air navigation plan defined by the International Civil Aviation Organisation (ICAO).

In the framework of an international cooperation protocol, the DGAC in France has made an expert available to the agency to support ASECNA in producing this strategic programme. This partnership was officially signed off on 11 September 2018 between the two director generals, Patrick Gandil for the DGAC and Mohamed Moussa for ASECNA.



**303 MILLION
PASSENGERS PER YEAR**

THE IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION) ESTIMATES THAT PASSENGER TRAFFIC IN AFRICA IS DUE TO GROW BY TWO-THIRDS BY 2035, TO REACH 303 MILLION PASSENGERS PER YEAR.

2.2%

**CURRENTLY, AFRICAN
AIR TRAFFIC** ONLY REPRESENTS 2.2% OF THE WORLD'S TRAFFIC.

JANUARY 2018

THE SINGLE MARKET FOR AIR TRAFFIC IN AFRICA CAME INTO BEING IN JANUARY 2018. THE AGREEMENT SIGNED PROVIDES FOR THE COMPLETE LIBERALISATION OF AIR TRANSPORT SERVICES IN AFRICA.



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●●● The “Single Sky” team must firstly conduct the project feasibility study, draw up its roadmap, and convince all the stakeholders of its rationale. Steered by Louis Bakienon, air navigation operations director of ASECNA, the team is made up of three people: Apollin Komguem Magni, Youssef Tidjani and Michel Aréno, of the DGAC international cooperation mission. The latter, familiar with Africa and ASECNA, is working exclusively on this programme.

The anticipated benefits of the “Single Sky” project include the capacity to take account of safe levels of traffic growth, the reduction in aircraft journey times, fuel savings and, by extension, reduced greenhouse gas emissions, along with fewer “pilot-ATC” radio exchanges and better civil/military coordination. These are all illustrations of beneficial spin-offs from the establishment of the “Single Sky for Africa”. Therefore, in order to guarantee its implementation, ASECNA will have to make sure that all its associated projects, both current and future, meet the requirements of the “Single Sky” programme. It may be noted that some of these projects are already underway, such as for performance-based navigation procedures, or for navigation and surveillance procedures using satellite technologies (SBAS, ADS-B).

This ambitious “Single Sky for Africa” programme will consolidate ASECNA’s position as leader in the provision of air navigation services on the African continent.●

1. Agence pour la sécurité de la navigation aérienne en Afrique et à Madagascar (Agency for Air Navigation Safety in Africa and Madagascar).



Two questions to



LOUIS BAKIENON,
AIR NAVIGATION OPERATIONS DIRECTOR
AT ASECNA

Remarkable involvement of all stakeholders

What challenges face ASECNA in its plans for a Single Sky for Africa?

The Single Sky for Africa targets a more secure and efficient use of the airspace concerned. The objective is to offer airlines greater flexibility to optimise their flight altitudes and take more advantageous routes and flight paths so as to make substantial fuel savings. All this is to be done while preserving the environment and reducing delays in vast regions comprising forests, deserts and hard-to-access zones. It addresses an operational need to absorb air-traffic growth and permanently improve the efficiency, performance and competitiveness of service providers, and it contributes to the establishment of a single air transport market in Africa.

In Africa, the average and continuous growth of traffic is in the order of 4% per year. Air-traffic control must permanently keep up-to-date to absorb this rapid growth. The integration and interoperability of the systems, the modernisation of the infrastructures, the constant revision of the methods and the pooling of procedures are the keys to success; hence the implementation of a uniform sky across the whole of Africa. ASECNA aims to set itself up as the go-to supplier of air navigation services within this scenario.

What purpose does DGAC support serve in the framework of cooperation with ASECNA for this programme?

The DGAC and ASECNA have a long history of bilateral cooperation, manifesting the desire to act in tandem for better service to users. France is a member of ASECNA. Hence the interest of support from the DGAC, whose contribution to the creation of a Single Sky will involve participation in studies, training actions and exchanges of experts, but above all the lessons learnt from the various European Single Sky projects. Let us also recall that France and ASECNA are partners in the flight procedures in Africa programme established by ICAO, which sets precise objectives for performance-based navigation.

France keeps on with its cooperation with Eastern Europe and the Balkans



“Starting from practically nothing, Kosovo developed all competency requirements thanks to the training provided by French experts, technical personnel and air-traffic controllers in the early 2000’s.”

BY **JACQUES WEYANT**,
SENIOR COOPERATION OFFICER FOR
EUROPE, CIS AND JAPAN INTERNATIONAL
WITHIN THE DTA.

The DGAC has already been helping for several decades East European and Balkans countries to converge towards European and international standards with regard to air transport safety and security. Other countries are eager to take advantage from this bilateral support, with the financial aid of the European Union.

BY **Olivier Constant**

Established after the fall of the Berlin Wall to help the newly-independent East European and Balkans States create their own civil aviation authorities, the international cooperation activities have developed bilaterally or under the aegis of the European Union. It is the EU which came up with, and partially financed, specific programmes for transferring competences via twinning projects between the civil aviation authorities of the Member State and their newly-created counterparts. Those projects started with the Southern Balkans (Kosovo, Montenegro, Macedonia, Serbia, Albania), while East European countries such as Georgia, Ukraine, Moldova took a little longer to take advantage of them.

ADOPTING BEST PRACTICES

Through bilateral exchanges of experts, these countries have been able progressively to adopt ICAO standards in air transport safety and security, to name two main areas of civil aviation.

One of the most notable actions was to the benefit of Kosovo: “Starting from practically nothing, this country developed all competency requirements thanks

to the training provided by French experts, technical personnel and air-traffic controllers in the early 2000’s,” recalls Jacques Weyant, Senior cooperation officer for Europe, CIS and Japan international within the DTA.

STRONG ACTION IN TAJIKISTAN

In recent years, the Mission of International Cooperation (MCI) has extended its scope of action to Central Asian countries, where the needs are great. A particular example of this is Tajikistan. Having used the airport at Dushanbe during its intervention in Afghanistan, the French Air Force provided the funding to build a new control tower. Its construction, nearly completed, was carried out by the DGAC’s National Aeronautical Engineering Service (SNIA). Under MCI’s initiative, the DGAC has already decided to back up this French presence with a cooperation programme together with the Tajik civil aviation authority. This is another example of the bilateral support the DGAC can provide through MCI, despite limited financial resources.

One particular focal point in this is on training Mac-The focus was recently, for example, on training Macedonian, Montenegrin, Bosnian and Serbian experts in airport certification and PBN¹ procedures design. The MCI works in conjunction with DSAC² South and ENAC³ to welcome these experts for that purpose.

These exchanges, which contribute to aviation safety and the dissemination of French aeronautical culture, could in the future help prop up France’s positions within ICAO or the European Civil Aviation Conference (ECAC). ●

1. Performance-based navigation.

2. Direction de la sécurité de l’Aviation civile (French civil aviation safety directorate).

3. École nationale de l’aviation civile (Civil Aviation National University).



European twinning: a tool to promote convergence

Via the Mission of International Cooperation (MCI), the DGAC is actively involved in the European Union twinning policy, as it was recently the case in Tunisia. This cooperation supports the EU neighbouring countries in their convergence towards international standards.

BY **Frédéric Magnan**

Keen to help the EU's "neighbours" to adopt the international standards and regulations of the European Aviation Safety Agency (EASA), the European Commission has established for several years twinning programmes between the Member States of the EU and the "beneficiary" countries. For the European Union, the objective remains to foster development toward

the liberalisation of air transport - "open skies" - while guaranteeing optimum safety and security levels, in accordance with the international standards of the International Civil Aviation Organisation (ICAO).

FRANCE-TUNISIA: A FRUITFUL AND STRUCTURING TWINNING PROGRAMME

DGAC's MCI, an entity of DTA (French Air Transport Directorate), has the tools required for addressing the commitment of France to play its part in ICAO's initiative: "No country left behind".

This was the background of the twinning initiative between France and Tunisia, which ran from April 2016 to August 2018. Financed entirely by EU funds and initially scheduled for 24 months, it was finally extended for four additional months. The twinning project, coordinated by the MCI, mobilised no fewer than 44 DGAC experts, including 15 from the DTA, and one Resident Twinning Adviser locally throughout the duration of the contract. *"Twinning is a fruitful and structuring tool that establishes deep and lasting links with the beneficiary country,"* explains Sophie Germain, Africa manager of the MCI. Safety, security, market access, air-traffic management, passenger rights, environmental protection, search & rescue: these were all work topics of this twinning project. Following an assessment of the organisation and the procedures, as well as of the handbooks and competences of the Tunisian Authority, an action plan was implemented. This resulted in training courses conducted both locally and at ENAC (the French Civil Aviation University), as well as technical visits and on-the-job training in France. In spring 2019, an ICAO audit will assess the progress made by the Tunisian authority. *"Yet the story does not end there,"* says Sophie Germain: *"Tunisia's transition towards European regulations will continue with the support of the EU following the signature of an open sky agreement between UE and Tunisia in December 2017. Besides, DGAC has signed a bilateral cooperation agreement with its Tunisian counterpart aimed at extending the exchanges between experts."* ●

→ Application

France's candidacy for a twinning project with Lebanon

A DGAC delegation visited in early May Beirut to present France's application for a two-year twinning programme designed to enable a transfer of competences and knowledge for the benefit of Lebanon. *"Safety and security are the main topics of this twinning project, with Beirut airport constituting a direct gateway to the European Union,"* stresses Karim Bekkouche, Middle East and South Asia manager for the MCI. Long-term links exist between France and Lebanon, in particular by way of a cooperation agreement between the DGAC and its Lebanese counterpart, that was renewed in 2017. This link constitutes an asset for the application presented by the MCI.

The Indian Ocean rises to the security challenge

Air transport is a major development issue for the States of the Indian Ocean. The regional stakeholders are working on obtaining regulatory convergence with the European Union, with expert help from the DGAC and its representatives in La Reunion.

BY Frédéric Magnan



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The skies over La Reunion, Mauritius, Madagascar, Seychelles and Comoros constitute a major backdrop for the economic development of these States of the western Indian Ocean.

While certain links are already fairly busy - more than 500,000 passengers per year fly between Mauritius and La Reunion - the fragmentation of the offering between the various national carriers and poor connectivity with the rest of the world, in particular, are restricting growth in the sector. Under the banner of a "Commission of the Indian Ocean States", in which France - through La Reunion - is involved, the countries in the area are committed to a process of regulatory convergence. The objective is to improve regional air services as well as the connections with the major international routes. "France has a role to play in the region, thanks to its experience, in providing assistance to and sharing best practices with the other stakeholders in the area," explains Sophie Germain, Africa manager for the Mission of International Cooperation (MCI) of the DGAC. Already, in 2016, the national airline of Madagascar could be withdrawn from the "blacklist" (Annex B) of the European Union as a result of cooperative work with the DGAC. Some months

→ Jobs

An open door to training

"In terms of training, we have put in place a 'Trades' Forum' to which we have invited our counterparts in the area," says Lionel Montocchio, Director of the Indian Ocean DSAC. "Last year, the decision was made to create an aviation industry branch for France and the Indian Ocean, which should be set up in 2019." For its part, the Indian Ocean Air Navigation Service is sharing, within the zone, its skills in the field of search & rescue, by proposing its training to the regional bodies. "We are also organising, in collaboration with the Agency for Air Navigation Safety in Africa and Madagascar (ASECNA), FIR (Flight Information Region) meetings with the adjacent regions," explains Lionel Dutartre, Head of the Indian Ocean Air Navigation Service.

earlier, in August 2014, a Civil Aviation Committee had been created, in which the DGAC was immediately involved. "The cooperation programme was put in place with the support of the MCI and the funding of the European Aviation Safety Agency," explains Lionel Montocchio, Director of civil aviation safety for the Indian Ocean, in Saint Denis. "The convergence programme, in which Madagascar plays a leading role, aims to get the States to update their own regulations. It must also facilitate the development of local partnerships, such as the exchange of inspectors, for example," says Sophie Germain. An initial phase of the programme, over the first six months of 2017, consisted in assessing the transition work. The convergence work proper then began, each country having its own schedule of actions, involving topics concerning the regulation and management of aircraft navigability, the management of maintenance workshops, and aviation mechanic licences. "It will take between three and four years to complete the process," estimates Lionel Montocchio. Yet the ambition is already taking shape to develop a "second circle" of the DGAC's sphere of influence out of La Reunion, linked to the African States this time, to participate in particular in creating a network of regional inspectors. ●



Flawless support for industrial exports

Through dedicated working groups, the DGAC actively supports French aerospace manufacturers located in China, Russia and Japan: a key contribution to support strategic projects.

BY Olivier Constant

Industrial cooperation with China, Russia and Japan already has a history. In some cases, it dates back to the post-war years, as it is the case with Franco-Russian cooperation. This cooperation is all the stronger inasmuch as the DGAC plays a supporting role for exports for the French aerospace industry. Within the French Air Transport Directorate (DTA), the Mission of international cooperation (MCI) and the Aeronautic industry department (SDC) are working together in this area. This support occurs by holding specific working groups dedicated to industrial cooperation. The benefits of which are most welcome by all stakeholders. Marc Sorel, CEO of the Powerjet joint venture created in 2004 between Safran Aircraft Engines and NPO Saturn to power the Sukhoi SuperJet 100 aircraft, agrees: *“The DGAC is a precious intermediary for making our voice heard by the Russian authorities. This is particularly useful for questions linked to import taxes, just to name one of the most recent examples.”* These working groups can also be tripartite, such as the one set up with Japan in March 2017, bringing together the Japanese Ministry of the Economy, Trade and Industry (METI), the DGAC and Airbus.

INTENSIFYING COOPERATION

“The challenge is to ensure that the forthcoming RFPs for new programmes, such as the Chinese-Russian wide-body C929, will also be open to French companies,” explains Jacques Weyant, Europe, CIS and Japan international cooperation officer with the DTA. This can only serve to reinforce our already robust positions. Accordingly, the Safran Group, through its Powerjet company, qualifies its cooperation with the Russian company UEC Saturn as “exemplary”. *“We are the only*



“The DGAC is a precious intermediary for making our voice heard by the Russian authorities. This is particularly useful for questions linked to import taxes, just to name one of the more recent examples.”

MARC SOREL,
CEO, POWERJET

Western engine manufacturer to have successfully maintained a long-term industrial cooperation,” says the delighted Powerjet boss. This cooperation will intensify with increasing Russian participation in the maintenance activities (MRO) for the SaM146. Safran is also considering the possibility of extending the Russian industry share in the production of the LEAP engine by CFM International. French manufacturers are also expected in China. *“At China’s request the cooperation has been intensifying. Thanks to the existing working group, we provide a privileged channel for high level exchanges. This fosters a balanced cooperation between our two countries,”* explains Thibaut Lallemand, Asia-Pacific cooperation manager at the DGAC’s Department of International Cooperation. The latest concrete example of this cooperation is the creation of an Airbus A330 delivery centre in Tianjin, operational since late 2017. Other manufacturers are also interested in this type of cooperation. Specialised in innovative digital solutions for manufacturing using numerically controlled machines, SPRING Technologies (subsidiary of the Hexagon Production Software Group) wishes *“... to be able to work in collaboration with the DGAC. This would allow us to penetrate more rapidly the Chinese market, even if we have already benefited from the help of Safran and Airbus. The latter have, indeed, introduced us to some of their local suppliers,”* explains Gilles Battier, CEO of SPRING Technologies. ●

Enac helps promote French know-how worldwide

International by nature, ENAC (École nationale de l'aviation civile - French civil aviation university) places its know-how at the service of aeronautical professionals all around the world. Its international reputation goes before it. It is partnered with around 80 universities and higher educational establishments, and more than half of its students are international students, from 50 different countries.

BY Sylvie Mignard



The powerful presence of ENAC worldwide results from a globalisation strategy initiated 20 or so years ago, notably in China. *“This strategy helps propagate the reputation of French civil aviation worldwide,”* exclaims Olivier Chansou, director-general of ENAC. *“Furthermore, since air transport is international by nature, this allows us to match ourselves against the best in the world and in this way pursue our excellence goals.”* This is an approach that is manifested in exchanges with foreign schools or universities - enabling the students at ENAC to pursue part of their studies abroad - and in the

establishment of many training courses worldwide in partnership with universities, schools or businesses.

A STRONG PRESENCE IN ASIA

“We propose courses from Bachelor’s degree to Master’s level spanning the whole of civil aviation,” explains Mathy Gonon, director of studies and research at ENAC. *“We offer, in particular, many advanced Master’s whose programmes have been conceived in close liaison with our partners.”* The school trains, for example, the air-traffic ●●●



●●● controllers of the Eurocontrol Control Centre in Maastricht, and is particularly active in Asia. ENAC has had a presence in China since the early 2000's. *"In partnership with the CAUC (Civil Aviation University of China) of Tianjin, in 2007 we created an aeronautical engineering training course recognised by the French engineers' body, the CTI,"* says Pierre Lahourcade, director of international affairs and development at ENAC. *"More than 100 students can therefore follow a course comparable to that at ENAC, with one year of French followed by the equivalent of higher and specialised maths, and three years of study. Today, in China, we have seven or eight programmes with the best possible partners."* In partnership with the most prestigious Chinese University, the Tsinghua University of Beijing, for example, ENAC has thus developed a Specialised Master's in Air Transport Management and an Executive MBA in Aeronautics, aimed at Chinese civil aviation and aeronautical industry executives, and proposed in collaboration with Ponts ParisTech, supported by Airbus.

CONTINUOUS DEVELOPMENT

Southeast Asia is also one of the choice locations for the international development of ENAC, with courses proposed in the Philippines, Indonesia and Vietnam. ENAC has also opened, in partnership with the Hong Kong University of Science and Technology (HKUST), the 6th-best Asian university for engineering, a Master's in aeronautical engineering along with, in conjunction with the HKIAA (Hong Kong International Aviation Association), a specialist Master's in air traffic management. This serves to create a platform of excellence in the region.

The school also continues to establish footholds around the world with, for example, a specialised Master's in air navigation management in Brasilia and the imminent launch of courses in Montreal and Ivory Coast. ●

ENAC RECEIVES:

MORE THAN
2,000
STUDENTS

MORE THAN
5,000
TRAINEES ON CONTINUOUS
TRAINING A YEAR AT ITS
TOULOUSE CAMPUS; MORE THAN 55%
ARE FOREIGN NATIONALS.

→ Training pilots

A major challenge for companies and manufacturers

In the next 20 years, the aviation sector will need an extra 500,000 pilots to face the growth in traffic. Their training is therefore a crucial issue both for airline companies and aeronautical manufacturers, keen to help their clients address this challenge. On the strength of its reputation for excellence, ENAC supports its partners in the aviation world in the face of this demand. Hence it is already training cadets from China Eastern, China Southern, Royal Air Maroc, Air Macao, Air Oman, etc. Also, in 2018, Air France entrusted it with training a large proportion of its cadets. *"We decided to relaunch our cadets channel as we need 250 new pilots per year,"* explains Didier Nicolini, Pilots HR director at Air France. *"The first year's intake therefore comprises 130 cadets, selected on the basis of psychomotor and psychometric tests conducted by ENAC and interviews carried out by Air France. They will then receive 20 months' training suited to our needs. We wanted, for example, for them to benefit from four weeks on gliders at the Montauban gliding centre."* Paid by the company, the cadets of the first year's intake have already started their course, while the second is due to start soon.

At Airbus, the training of pilots is also a significant commercial issue. *"We wanted to support our clients faced with the growth in their fleets,"* says Susannah Crabol, Solutions Manager for pilot training in the teams of Jean-Michel Bigarré, International Director for pilot training at Airbus. *"Until now, we essentially handled the intermediate and advanced training phases for pilots, on 10 sites around the world. We have now decided to take charge of all pilot training, from initial training onward, and have developed with ENAC a programme based on the highest-level technical and safety standards. Our 'ab initio' training programme for pilots may also be dispensed in partner pilot schools around the world."* The objective is to join forces with 4 to 5 schools per year, each of which could accommodate around 200 cadets, for an average training period of 20 months. The first school to dispense this new complete pilot training is the Escuela de Aviación in Mexico City, where the first courses began in late January 2019. A second school in Europe is scheduled for the spring.

A new heading for DSNA Services!



Created five years ago by the DGAC and ENAC, DSNA Services, the French civil aviation consultancy and expertise office, has had a facelift. With a new name and a new strategic plan, it wishes to showcase and promote its specific know-how in order to raise its profile.

BY Sylvie Mignard



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Exporting French civil aviation know-how worldwide: this is the primary objective of DSNA Services. This approach is manifested in the establishment of cooperative ventures with the civil aviation authorities around the world, as well as with operators and manufacturers¹, to help them achieve conformity with the different regulations, the best operational practices and ICAO standards. Hence, DSNA Services has for example supported Sudan in the reorganisation of its airspace, co-developed a drone detection solution, Hologarde®, and is today working on the development of the Haitian Oversight Authority, OFNAC, and on the renovation of the Bolivian air-traffic control systems in collaboration with Thales.

EXTENDING ON NEW PROBLEM STATEMENTS

This know-how, through recourse to the experts of the DGAC, contributes to the expanding reputation of French expertise in civil aviation, as well as to ramping up its skills levels. “Our missions allow the experts to come face-to-face with varied approaches and contexts,” emphasises Farid Zizi, Executive Director of DSNA Services. “Enriched with this

Viewpoint



FARID ZIZI,
EXECUTIVE DIRECTOR
OF DSNA SERVICES

DSNA Services is a little like a French Sport National team, in the ‘World Cup’ of Civil Aviation. The idea is quite simple: it consists in getting players from different clubs to play as a team on a recurrent basis, with all the ingredients that you get in sport: play in your position, but offer support when needed; have a solid subs bench; get everyone to feel that they are involved even if you’re not training every day together, whether this concerns the experts or the partners.”

diversity of experience, they can provide original solutions for clients, but also for the DGAC in the face of the problems that the DGAC is likely to encounter sooner or later. This therefore helps to bolster French expertise.” This still-young structure is entering a consolidation phase, with the arrival of its new director in September and the generation of a new strategic plan.

A NEW NAME TO GO WITH AN AMBITIOUS STRATEGY

A plan is being organised around broad lines of development such as reinforcing collaboration with DGAC experts, establishing new partnerships, developing teams, and expanding the catalogue of services proposed to the civil aviation authorities worldwide, to facilitate the implementation of their obligations. Yet recognition of DSNA Services also involves creating a strong identity, perfectly identifiable worldwide. The name of the entity was indeed liable to lead to confusion with that of DSNA (Air Navigation Services Directorate). Hence the name change, as from summer 2019, which should unambiguously reflect its mission-statement to promote French experience and expertise and be equally meaningful in French and in English. “This name will allow us to construct a communication and brand strategy that will help make our services better known around the world,” notes Farid Zizi. ●

1. In their export activities, manufacturers must take account of international standards and best operational practices.



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