MINISTÈRE
CHARGÉ
DES TRANSPORTS

*Liberté*
*Égalité*
*Fraternité*

dgac direction générale de l'Aviation civile

# ACTIVITY REPORT

## CIVIL AVIATION TECHNICAL SERVICE

2024

# SUMMARY

# Editorial

## by Gervais GAUDIÈRE, director of STAC

In 2024, thanks to the mobilisation of its skills at a high level, STAC continued to play a very active role in the development of future standards and methods in the airport field, promoting innovation and sustainable development, while remaining at the service of current projects.

In this respect, the STAC's international standard-setting activity and its participation in numerous projects have remained sustained and illustrate its commitment to respecting the DGAC's desire to take part in the technical definition of tomorrow's airport world, in terms of the promises offered by new technological solutions but also to contribute to removing its uncertainties. In addition to the work carried out by all the teams within the various international bodies, the renewal of the STAC's Scientific Advisor's chairmanship of the EUROCAE standardisation agency is a mark of this involvement. In addition to its standard-setting activities, the STAC responded jointly with the DSAC to EASA's request to contribute to new system certifications in the ATM field.

The innovations supported or monitored by STAC include improving knowledge and control of the environmental footprint of airport activity and its response to climate change. Work on noise, biodiversity and fine particles naturally fall within this ecological field, but it also includes work on improving precise knowledge of the condition of pavements in order to optimise their structures, which are very costly in terms of resources. The STAC is happy to disseminate the knowledge available through various guides and technical notes. It also contributes to innovation by steering the Transport Innovation Agency in collaboration with the DGITM and the DGAMPA. After several years in existence, the AIT is now entering a phase of consolidation around its priority actions.

In a world subject to significant geopolitical changes, STAC also pays close attention to keeping pace with technical developments in airport security, taking into account the detection of new types of threats. In 2024, for example, STAC carried out major initiatives to update its methods in order to certify tomorrow's airport equipment.

Naturally, preparing for the future must be based on today's concrete practices. STAC's mission is to make a direct contribution to meeting the expectations of current projects. In this respect, participation in the renewal of airport concessions has required a major mobilisation of the department's many areas of expertise.

The year 2025 will see the holding of the STAC technical day in June. In the meantime, I hope you enjoy reading this 2024 activity report.

# Key facts

# INSTALLATION OF THE ATMOCA UNIT

The main activity of the ATMOCA unit is to manage, on behalf of the Air Transport Division, consultancy and technical expertise assignments for aeronautical construction and improvements (terminals, runways, infrastructure, engineering structures, etc.) as part of airport concession renewals and their monitoring.

As such, it assisted the DTA with the concession renewal projects for Nantes Atlantique, Cayenne Félix Éboué, Nouméa La Tontouta and Tahiti Faa'a airports.

# Resources

# Staff

| WORKFORCE AT 31 DECEMBER 2024 | |
|---|---|
| TECHNICAL STAFF | |
| IPEF | 2 |
| IEEAC | 25 |
| ITPE | 21 |
| IESSA | 4 |
| TSEEAC | 31 |
| TSDD | 11 |
| Contract agents and RIN | 16 |
| Apprentices | 2 |
| TOTAL TECHNICAL STAFF | 112 |

| ADMINISTRATIVE STAFF | |
|---|---|
| Ancillary | 2 |
| Assistants | 5 |
| Assistants | 8 |
| TOTAL ADMINISTRATIVE STAFF | 15 |

| BLUE-COLLAR STAFF | |
|---|---|
| AC workers | 11 |
| Defence workers | 1 |
| TOTAL BLUE-COLLAR STAFF | 12 |
| GENERAL TOTAL | 139 |

# ORGANISATION CHART
# march 2025

ORG/STAC/DIR/NAME CHART VERSION 01

## DIRECTION

**Director : Gervais GAUDIÈRE**

| | |
|---|---|
| CHIEF OF STAFF | N. |
| QUALITY MANAGER | Stéphane LY |
| RADIATION PROTECTION OFFICER INNOVATION OFFICER | Christine FUCHÉ |
| SECURITY OFFICER | Laurent FELGINES |
| INFORMATION SYSTEMS SECURITY OFFICER | Laurent FELGINES |

## DEPARTMENTS

### ADMINISTRATION, INFORMATION SYSTEMS, BROADCASTING

**Chrystèle GROUAS-GUITTET**

Head of Budget Preparation, Monitoring and Performance
**Laëtitia GAY-NÈGRE**

Administration and Knowledge and Knowledge Capitalisation Division
**Francine MERCIER**

Project Assistance and Information Management Division
**Laurent FELGINES**

### ENVIRONMENT, SYSTEMS AND OPERATIONS PLANNING, ADMINISTRATION

**Catherine BONARI**

Drone Project Manager
**Fabrice ALGER**

Environment Division
**N.**
**Deputy: David SMAGGHE**

CALIPSO Program Manager
**Denis WEBER**

Acoustic Studies, Analysis and Modelling Subdivision
**Julien LEPOUTRE**

Acoustic Measurements Subdivision
**Thierry CABANNES**

Wildlife hazard and Biodiversity Prevention Subdivision
**Constance ANELLI**

Water, Soil and Air Quality Subdivision
**Stéphanie KERBRAT**

Safety, Performance and Planning Division
**André BARKAT**
**Deputy: Lionel MAZZELLA**

Capacity Activity
**Alexandre GAMA**

Aerodrome Safety Division
**Lionel MAZZELLA**

ATM-ANS Safety
**Loïc EYGLUNENT**

Aeronautical Easement Plans Activity
**Mauro BORTOLOTTO**

### AIRFIELD PAVEMENT DEPARTMENT

**Michaël BROUTIN, Ph. D.**

Safety - Structure and Eco- design Division
**Lucy TRAVAILLEURU, Ph. D**

Program Manager
**Enzo MARIETTE**

Safety - Skid Resistance Division
**Hervé BILOT**

Program Managers
**Yasmine EL KHATTABI**
**Célien GOOSSAERT**

Testing and Expertise Laboratory
**Mohamed ABEDRABOU**
**Deputy: Sylvain MATHOURAPARSAD**

Measuring Equipment and Innovation Officer
**Gabrielle LEHUREAU, Ph. D**

Operational units
- Intercomparisons
- Auscultation
- Lift/IS

Artificial Intelligence Officer
**Loïc SHI-GARRIER, Ph. D.**

Deputy Director: Francis BRANGIER

MANAGEMENT REPRESENTATIVE FOR THE TOULOUSE SITE

Francis BRANGIER

SCIENTIFIC AND INTERNATIONAL ADVISOR DELEGATE
COORDINATOR OF THE TRANSPORT INNOVATION AGENCY

Guillaume ROGER

## AIRPORT SECURITY AND AERODROME SAFETY EQUIPMENTS

Sébastien JALET

Cybersecurity Project Manager
**Franck STEUNOU**

Security Division
**Frédéric TELMART**
**Deputy: Ludovic ISNARD**

International Methods and Actions Subdivision
**Alexis SANTORO**

Networks, Equipment and Systems Laboratory
**Gaël WEIDMANN**

Pyrotechnic Certification and Evaluation Laboratory
**Sylvain TAUZY DIT LONNE**

Equipment Division
**Éric OMNÈS**
**Deputy: Valérie FOK BOR**

Program Manager
**Guillaume CASTERAN**

Visual Aids Subdivision
**Jean-Claude BICHET**

Energy Subdivision
**Ludovic LEGRAND**

Airport Fire and Accident Response Subdivision
**Laurent OSTY**

## TECHNICAL ASSISTANCE TO CONTRACTING AUTHORITIES FOR AIRPORT CONCESSIONS

Head of Mission
**Régis ROMAGNY**

Project Manager
**Didier DERRIAS**

## NAVAL AIRFRAME

Gabriel BERCARU

Stopping strands workshop
**Laurent BESSIÈRES**

### STAC BONNEUIL

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# Social dialogue and training

# SOCIAL DIALOGUE

In 2024, with the support of the Administration, Information Systems and Broadcasting department, the STAC organised three meetings of its Social Administration Committee (SAC) in plenary session, and one meeting of its SAC in specialised session on health, safety and working conditions (FS):

- On 14 March 2024, the STAC's CSA discussed, in particular, the monitoring of the workforce;
- On July 4, 2024, it voted to update the STAC organisation memorandum and presented the single social report for 2023 to the trade unions;
- On 3 October 2024, the SHA met as a FS to present the management of chemical removal and the health and safety registers for STAC's three sites. It also

also discussed the workplace safety analysis (AST) for the Biscarrosse site, studied the data relating to quality of life and working conditions, and took stock of the work carried out, in progress and to come;

- On 5 November 2024, the STAC CSA set the closure dates for the 3 sites of Bonneuil, Toulouse and Biscarrosse for 2025 and discussed the new time management tool.

# STAFF TRAINING

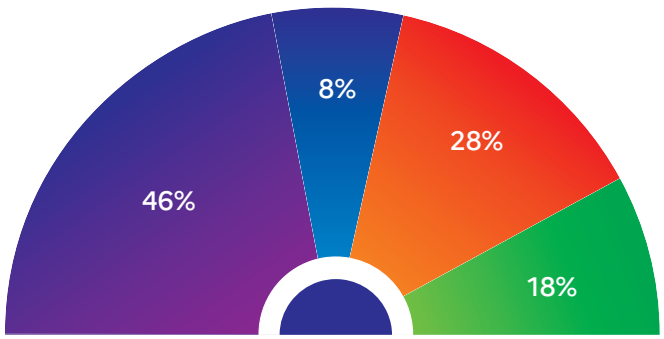
To take account of the specific nature of its activities, the Administration - Knowledge Capitalisation division implements its technical training plan every year.

This training plan is a tool for implementing the STAC's policy of developing the individual and collective technical skills of its staff, and ensures that all staff receive appropriate training based on their professional projects and the department's needs in terms of skills and expertise in its business lines.

In 2024, the Administration and Skills Capitalisation Division set up 33 training agreements with training centres recognised for their expertise.

A total of 87 staff benefited from this type of specific training, at a total cost of €91,500 for 2024.

Staff training by department:




- SA: Structure and Adherence Department;
- ASID: Administration, Information Systems, Dissemination Department;
- SE: Safety, Equipment Department;
- ESSOP: Environment, Systems and Operations Safety and Planning Department.

# Courses offered


## SURET / SURSIMSEQ / International

Each year, the STAC Security Division runs several training modules in courses organised by ENAC:

- 2 training sessions on security equipment (SURET) were given to the various players involved in air transport security (airlines, aerodrome operators, government departments, etc.).
- 3 training sessions on x-ray imaging and image quality testing (SURSIMSEQ) were given to security officers from private companies.

The STAC also organised, on behalf of the European Civil Aviation Conference (ECAC) and for the benefit of security auditors, a training course entitled "ECAC Workshop on Security Equipment" from 16 to 17 October 2024 in Peru. The aim of this training was to support the Peruvian Civil Aviation Authority (CAA) in deploying and monitoring the use of new security equipment at Lima airport and sharing European best practices on the use of advanced technologies in the field of aviation security.

# REVIEW OF THE TRAINING PROVIDED BY AIRFIELD PAVEMENT DEPARTMENT

In line with previous years, the Airfield Pavement department continued to provide training sessions for the benefit of the Ministry engineering schools : ENTPE and ENAC. These courses will be renewed since the feedback has once again been positive.

In 2024, the training offer around airfield pavements topic proposed by ENAC has been increased. Indeed, a new Airfield Infrastructure Asset Management formation has been set up and held for the first time. This training will be continued from 2025.

Finally, the Airfield Pavement department has maintained its involvement in the training of French Ministry of the Armed Forces agents, providing various training modules for the benefit of SID and 25th RGA agents.

# ENVIRONMENTAL TRAINING

In 2024, the Environment Division ran several training courses for ENAC. The experts provided the environment module of the "Airport technical position" training course on subjects such as air quality, noise, de-icers, wildlife hazard and biodiversity.

In the area of noise, engineering students from ENAC and the French Air Force have been trained in acoustics and modelling. In addition, STAC staff supervise the "Modelling" training course for the DGAC modellers' network. "Modelling" for the network of DGAC modellers.

In the area of willdlife risk management, RISKAN and ADR-ORNI training courses have been delivered to staff at civil airports and air force and space bases. These courses continue to be highly appreciated by participants, and are now fully integrated into the training plan for Air Force staff.

In the field of biodiversity, the STAC has also been involved for the past two years in the following training courses The "Aéroports et Environnement" (Airports and the Environment) course is designed to provide a better understanding of environmental issues in airport operations and development practices and projects.

# TRAINING PROVIDED BY THE SAFETY, PERFORMANCE AND PLANNING DIVISION

The staff of the Safety, Performance and Planning Division are involved in disseminating expert knowledge in their field to an increasingly varied group of trainees, including professionals, engineering and master students, technicians and air traffic controllers. The topics covered during the training courses included aerodrome planning and safety, heliports, obstacle limitation planning documents and airport capacity on both the terminal and runway sides.

# DOG HANDLER TRAINING

## From ATM to security surveillance of freight operators

For the past year, Gendarmerie des Transports Aériens (GTA) dog handlers have been playing a key role in the surveillance operations of dog teams dedicated to the search and detection of explosives in the air freight sector. Their involvement is part of the external regulatory quality controls carried out in collaboration with the DSAC (Direction de la Sécurité de l'Aviation Civile) and the STAC (Service Technique de l'Aviation Civile).

The training programme comprises several key components:

- Mastery of air freight regulations, toensure that checks comply with current standards;
- Exercises in writing inspection reports, to structure and formalise their observations in the field;
- Odour recognition tests, to fine-tune the accuracy and effectiveness of the dog-handling teams in meeting the demands of quality control.

At the end of this training, dog handlers sit an exam to validate their skills and obtain the official CynoFret Controller (CCF) qualification. This certification reinforces their expertise and legitimacy in air freight security missions.

Since the launch of this training programme in 2024, three sessions have already been organised, each attended by six dog handlers. The momentum is continuing, with sessions scheduled until 2026, guaranteeing optimum coverage of the air freight surveillance and control system.

Thanks to this increase in skills and the commitment of the GTA's dog handlers, the security of air freight transport is constantly being reinforced, ensuring an ever higher level of protection within France's airport infrastructures.

Photo modified by IA

# Finance

| DTA - BOP 614-1 | k€ |
|---|---|
| Environmental and security studies | 305 |
| Heritage - aeronautical pavements | 469 |
| Airport access control management system and various security | 24 |
| Laboratory for the detection of liquid and homemade explosives | 541 |
| Training | 141 |
| IT | 26 |
| Logistics | 264 |
| Staff travel expenses | 500 |
| Site security | 26 |
| AIT | 158 |
| TOTAL | 2 454 |

| DSAC - BOP 614-2 | |
|---|---|
| Safety and environmental studies | 66 |
| Aeronautical pavements | 337 |
| Airfield lighting and ARFF test centres | 218 |
| Operation of safety test centres | 760 |
| Quality - Metrology | 64 |
| TOTAL | 1 444 |

| DCSID - BUDGET MILITAIRE BOP 212 | |
|---|---|
| Maintenance of BAN/Auscultation/PEB stop strands | 297 |
| Logistics | 35 |
| Staff travel expenses | 16 |
| TOTAL | 348 |

| DTA - Civil budget P203 Nantes - Atlantique | 618 |
|---|---|

| RECETTES | |
|---|---|
| Certification and surveillance fees | 797 |
| ADP (product allocation) | 380 |
| TOTAL | 1177 |

# Programmes and Partnerships

# TRANSPORT INNOVATION AGENCY SUPPORT PROGRAMMES

The Propulse programme is the flagship support initiative of the Agence de l'Innovation pour les Transports (AIT). Its aim is to accelerate innovative projects in the transport sector that provide solutions to the major challenges it faces:

- Ecological and energy transition, resilience of services in the event of a crisis, the digital revolution, and strengthening regional cohesion.

Following a rigorous selection process, the winning projects are supported by the AIT and benefit from the support of government departments, coordinated by a lead expert for a period of 9 months.

This tailor-made support is designed to speed up and facilitate the project's scaling-up process:

- Removal of regulatory obstacles, legal support, connections with experts and the Ministry's scientific and technical network, identification of experimental sites to test prototypes or first series, and assistance in securing public and private funding, as AIT does not provide funding.

18 projects were selected and announced in February 2024 by the Minister in charge of Transport based on the three themes of the third edition of the PROPULSE call for projects:

- Sustainable Transport, Data Sharing and Multimodality and Intermodality.

AIT's support for the winning projects, which ran from March 2024 to December 2024, proved highly effective, with very satisfactory results, particularly in terms of securing funding, analysing and removing regulatory barriers and raising visibility.

The winners also benefited from the AIT funders' club, which brings together public and private stakeholders involved in French and European innovation funding schemes for the transport sector. The club's initial work resulted in a comprehensive inventory of available financial support for transport innovation.

The growing reputation of the Propulse programme and its proven impact over the years have led to the creation of a new support initiative. Its aim is to broaden AIT's role in the transport innovation value chain by targeting projects at an earlier stage of development than those supported by Propulse.

This new programme will target start-ups whose projects have not yet reached the prototype stage, supporting them during their incubation phase and helping them to develop demonstrators. Still under development, this new programme will be launched in 2025.

# Standardization and Regulation

## STAC RE-ELECTED AS PRESIDENT OF EUROCAE

In April 2024, STAC's Scientific and International Advisor was re-elected for a second year as Chairman of EUROCAE.

EUROCAE is the European leader in the creation and dissemination of globally recognised industrial standards for aviation. Founded in Lucerne in 1963 under the name "European Organisation for Civil Aviation Equipment", EUROCAE quickly established itself in the Paris region.

Over the past 60 years, EUROCAE has become a major player in the European aeronautical landscape, with 5,000 experts belonging to nearly 500 member organisations, including manufacturers, service providers , regulators, research institutes and international organisations.

Nearly 20% of members are organisations based in France, and nearly 70% are located in the ECAC region. More than 50 working groups are currently defining new standards. EUROCAE is recognised by the main European civil aviation institutions (EASA, EUROCONTROL, SESAR JU, etc.) and by ICAO, which are also members.

EUROCAE is involved in all current issues and challenges facing the aeronautics industry. As a result, EUROCAE is playing an important role in the implementation of public policies related to aeronautics. To this end, it has developed a large network of partners, particularly among other standardisation organisations (CEN, ISO, SAE, RTCA, ASTM, etc.).

Most of the standards issued by EUROCAE are directly recognised by EASA as a means of compliance with its regulations, and more than 100 are referenced by ICAO. Faced with an American industry supported by numerous standards bodies and a strong rise in Chinese competition, EUROCAE plays a major role in defending European and French economic interests.

The chairmanship of the EUROCAE Council provides an opportunity to steer EUROCAE's strategy and to play an active part in managing major dossiers for the construction of the Single European Sky, such as sustainable air transport, digitisation of the Single European Sky, a new certification framework for ATM/ANS ground equipment, new air mobility, radio spectrum and many others.

# UPDATE OF THE EUROCAE INDUSTRY STANDARD ON RUNWAY WEATHER INFORMATION SYSTEMS

The European Organisation for Civil Aviation Equipment (Eurocae) published the ED292 industry standard in December 2021, relating to Runway Weather Information Systems. This standard aims to define the minimum performance requirements for systems (sensors and software) that airport operators may choose to use to assist them in implementing the Global Reporting Format (GRF), which came into effect in Europe in August 2021.

In February 2024, Eurocae initiated a revision of this standard to enhance it, ensure consistency with other international standards, and expand its scope by incorporating information processing systems developed over the past three years by manufacturers for the application of the GRF and the surveillance of weather in the airport domain.

STAC once again leads the working group with the chairman position. The new version of the standard is currently being drafted and is expected to be submitted for public consultation in the second quarter of 2025, with official adoption and publication estimated for the fall.

# Quality Management

# CONFIDENTIALITY AND IMPARTIALITY

## A daily concern

Civil servants and non-civil servants working at the STAC are required to comply with the general civil service regulations applicable to state employees, particularly those relating to confidentiality, integrity, independence and impartiality. The STAC is committed to preserving confidentiality and respecting impartiality as part of its ISO 9001 certification. This provision therefore applies to all its activities, with the aim of contributing to the satisfaction and confidence of its institutional sponsors, customers and partners.

STAC's accredited testing laboratories reinforce this position to ensure that impartiality is not compromised by commercial or financial pressure. Accordingly, each laboratory regularly reviews the risks that could affect its impartiality, particularly those arising from its activities or relationships, or those of its staff.

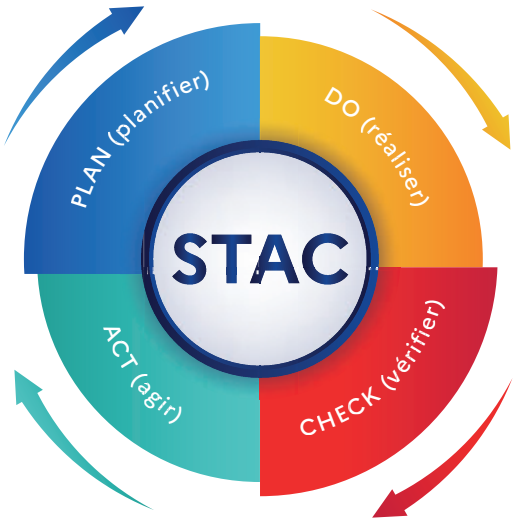
As regards confidentiality, the laboratories inform their clients or recipients in advance of any information they intend to make public. All information is considered exclusive and treated as confidential, apart from information made public by the client or in cases agreed with the laboratory.

To meet these requirements and maintain vigilance among our staff, all STAC agents are made aware of these obligations by signing an annual declaration of impartiality and confidentiality. This declaration is revised as soon as any change is likely to significantly alter its content.

# FITTING DGAC'S STANDARD REQUIREMENTS

ISO 9001 certification requires the implementation of processes for the continuous improvement of the quality management system (QMS). In 2024, at the instigation of the DSNA and the SNIA, an initiative was launched to share best practices, in which all DGAC departments with ISO 9001 certification can participate: the ClubISO.

The STAC has taken advantage of this opportunity to expand on its knowledge and gain insights from departments that have already validated their quality systems. This experiment, lasting until 2025, will enable the STAC's quality approach to fit the DGAC's standard requirements in QMS.



# AERONAUTICAL LIGHTING

## The VIS laboratory

The STAC operates several test and expertise laboratories, including the Visual Aids Laboratory (VIS), one of whose missions is to assess aeronautical lighting equipment, as required by French regulations, before it is installed on a French aerodrome exempt from European certification.

On the basis of these assessments, the STAC issues certificates of conformity for runway, approach or taxiway lighting, for airport lighting panels, for obstacle or wind turbine lighting and approvals for helipad lighting and panels.

Since 2016, the VIS laboratory has been accredited by the French Accreditation Committee in accordance with the NF EN ISO/IEC 17025 standard for carrying out photometry and colorimetry tests on fixed aeronautical lighting (airport, helipad or obstacle).

The certificate of approval issued by the STAC certifies that the photometric and colorimetric performance of the equipment tested complies with the applicable regulatory specifications.

These documents do not mention any validity date. They remain valid as long as no change is made to the certified equipment affecting its photometric and colorimetric performance (optical, electrical or mechanical).

Airport operators can consult the lists of certified or approved equipment on the STAC website and download the test request form for any new assessment requirements.

The laboratory is also working on the development of measurements in the infrared range and has equipped itself with specific equipment to respond to the emerging use of night vision systems in the aeronautical sector and the need to regulate this new area.

Finally, the laboratory's latest acquisition is a universal support for handling and positioning lights used as visual approach slope indicators (PAPIs) with a view to their evaluation. The PAPI systems, which are complex because of their size, can now be accurately positioned both indoors and outdoors in the black room dedicated to these assessments.

Once again this year, the laboratory, in conjunction with the Energy - Lighting subdivision, will host a day of discussions on "Aeronautical Lighting and Energy". This event will take place in the second half of 2025, at the STAC site in Toulouse.

The laboratory is constantly striving to meet the needs of its customers and maintain its recognised level of expertise.

# THE MACOUS LABORATORY MAINTAINS ITS COFRAC ACCREDITATION

The acoustic measurement laboratory has been accredited by the French Accreditation Committee (COFRAC) to carry out measurements in accordance with the latest CALIPSO Order, which came into effect on 17th July 2024. This requirement considers a new class of aircraft, A+, with a noise performance index of 90 or above.

An impact analysis carried out by the MACOUS laboratory showed the COFRAC that the test method remained valid and that the data processing tools involved in the testing had been adapted in line with the new Order, like the template of the testing report supplied to the DTA under COFRAC accreditation for CALIPSO that has also been updated.

The laboratory provides a graphical representation of the CALIPSO acoustic measurement classes.

| Classification : | A+ | A | B | C | D |
|---|---|---|---|---|---|
| IP (dB(A)) : | IP ≥ 90 | 60 ≤ IP < 90 | 30 ≤ IP < 60 | 0 ≤ IP < 30 | IP < 0 |

# Emerging areas

# Cybersecurity

## STAC'S INTERNATIONAL ACTIVITIES

### Strengthening civil aviation cybersecurity

In 2024, STAC's cybersecurity activities took off significantly.

STAC contributed to numerous initiatives aimed at strengthening the resilience of the aviation sector against growing cyber threats. Through involvement in international, European, and national working groups, STAC supports harmonized and robust responses to cybersecurity challenges in civil aviation.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ORGANISATION DE L'AVIATION
CIVILE INTERNATIONALE
INTERNATIONAL CIVIL
AVIATION ORGANIZATION

# ICAO (INTERNATIONAL CIVIL AVIATION ORGANIZATION)

## CYSECP (Cyber Security Panel)

STAC holds a **Member Seat** on this ICAO panel on behalf of the French State, actively promoting French positions. CYSECP includes representatives from 15 Member States.

STAC took part in key working groups:

- WGCTR (Working Group on Cyber Threats and Risks):
  - Assessment of global cyber risks specific to the aviation ecosystem.
  - Development of threat scenarios and risk evaluation methodologies tailored to aviation.
- WGCGM (Working Group on Cyber Guidance Material):
  - Frameworks for cyber incident management: detection, response, information sharing.
  - Guidelines for identifying, managing, and responsible disclosure of vulnerabilities.
  - Capacity building support for States.
  - Cybersecurity of aviation supply chains.

## Key Focus: Integrated risk management leadership

Together with **Thales**, STAC led the development of an **integrated risk management methodology** (safety, security, cybersecurity). This innovative approach was well received at the 2024 **Aviation-ISAC** conference.

## Key Focus: Supply chain cybersecurity leadership

STAC chaired a dedicated sub-group on cybersecurity in the **aviation supply chain**, aiming to:

- Identify specific supply chain cyber risks.
- Establish best practices for risk management, including supplier selection and oversight.
- Develop processes to strengthen the resilience of critical systems to supply chain-related cyber threats.

# Drones

## REGULATORY MONITORING AND SUPPORT

### The STAC listens to the drone ecosystem

In 2024, the STAC continued its commitment to regulatory monitoring and support for stakeholders in the drone sector, maintaining active surveillance of the evolving regulatory frameworks in response to technological and operational advances.

**◎ Reinforced regulatory monitoring**

The STAC's 'Drones' project management division has closely followed developments in the regulatory framework at international and European levels. Its interaction with the DTA and the DSAC has enabled it to track implementation of European regulations 2019/945 and 2019/947, which govern the design and operation of drones, as well as regulation (EU) 2021/664 on U-Space.

U-Space, which is based on a set of digital services facilitating the safe integration of drones with manned aviation in Europe, has been the subject of internal discussions within the DGAC. In 2024, the STAC played an active part in the work carried out by the DTA on the designation of U-Space areas in France, thus contributing to the structuring of the operational framework for these zones.

**◎ Structuring support for players in the sector**

On 18 October 2024, the STAC took part in a meeting to welcome the winning start-ups of the 2024 session of the Urban Air Mobility (UAM) Plaza Accelerator program. This program, led by a consortium including Toulouse Métropole and the Aerospace Valley competitiveness cluster, aims to promote the integration of innovative aeronautical technologies in urban mobility.

At this meeting, the STAC presented the European regulatory framework applicable to drones, VTOLs and U-Space operators. It provided valuable insights to the winning companies, helping them to identify the relevant authorities to discuss their project, the steps to be taken and the expected processing timelines.

In 2024, the STAC thus confirmed its key role as an interface between regulation and innovation, actively contributing to the development of the drone sector and its smooth integration into the airspace.

# THE STAC, AN INCREASINGLY IMPORTANT PLAYER IN DRONE STANDARDIZATION


In 2024, the STAC undertook a study aimed at mapping the organization and development of drone-related norms and standards at the international, European and national levels. Scheduled for completion in the first half of 2025, this study includes a detailed analysis of the working groups involved and of ongoing initiatives, particularly within bodies such as ICAO, ISO, CEN and EUROCAE. Its aim is to identify the drone standardization bodies in which the DGAC is already positioned, as well as the most strategic ones for the STAC to become involved, in order in particular to strengthen the STAC's drone expertise and actively contribute to the growth of this rapidly expanding sector.

In this context, the STAC, through its "Drones" project management division, joined the ICAO's Remotely Piloted Aircraft Systems Panel in 2024, thereby contributing to discussions on the integration of remotely piloted aircraft systems into international airspace.

At European level, the STAC has followed the work of the European Committee for Standardization (CEN) on drones, launched at the request from the European Commission and entrusted to the technical committee CEN/TC471. This request aimed to establish the technical normative framework (EN 4709 series of standards) with which drones subject to Regulation (EU) 2019/945 must comply before being placed on the market. Thanks to this active monitoring, the STAC has kept abreast of developments in European regulations and standards in the sector. This involvement was reflected in its participation in the meetings of the BNAE "Drones" Standardization Commission, the French mirror structure to CEN/TC471.

# Artificial Intelligence

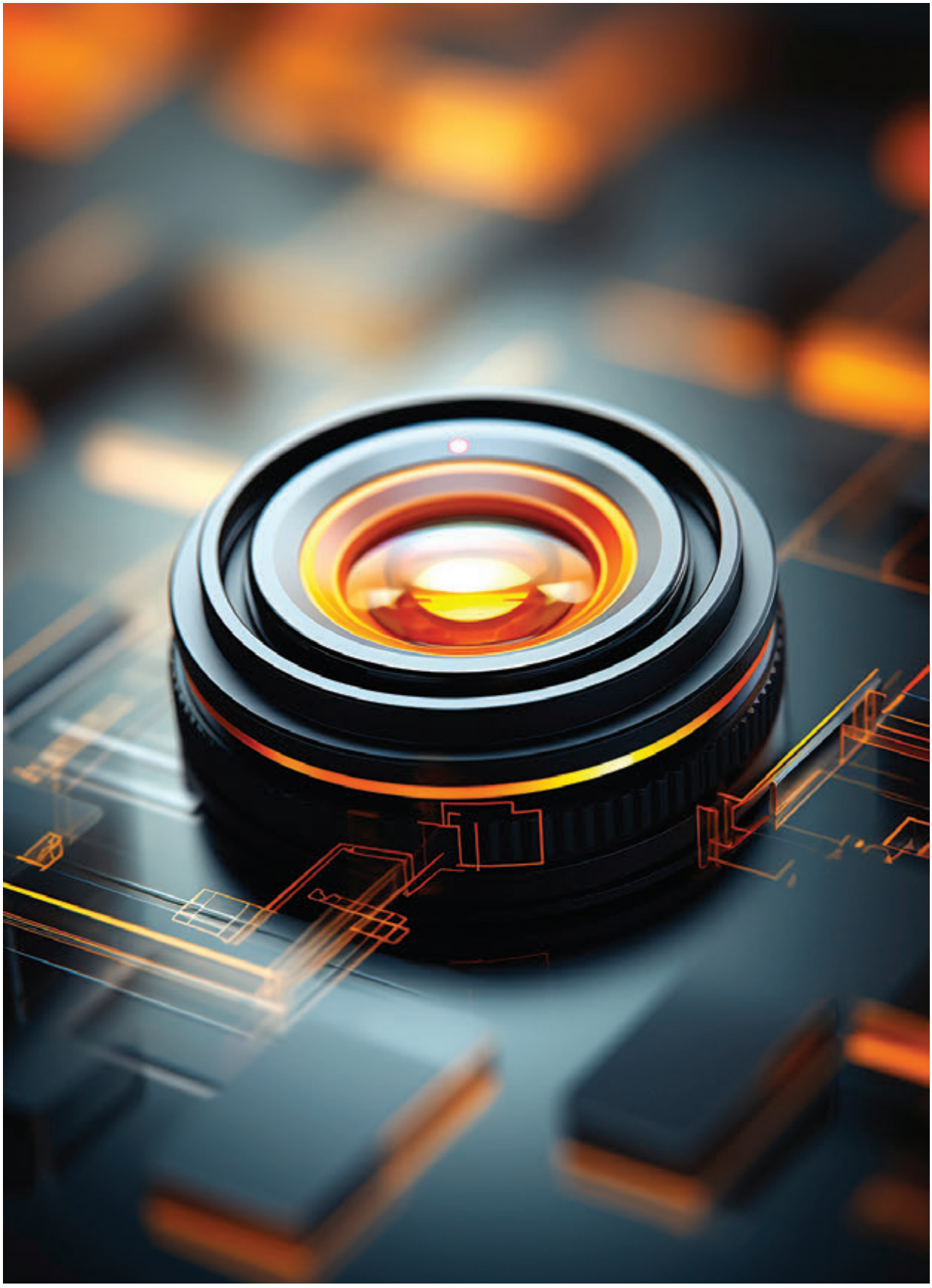
## HARNESSING ARTIFICIAL INTELLIGENCE FOR HIGH PERFORMANCE IS

The management of the French aeronautical pavement infrastructure requires regular monitoring of the condition of these pavements. The traditional method recommended by the STAC, known as the "indice de service" (IS), relies on visual inspection of surface degradations (e.g., cracking, rutting). The observed distresses s are then used to calculate a rating of pavement condition, enabling assessment of its service level and better planning for maintenance.

New technologies, such as Lidar-based sensors, now allow high performance surveying of pavement condition. These systems reduce operational impact, subjectivity of surveys, and the number of personnel required. However, these costly technologies are challenging to deploy on smaller or less accessible airfields (especially in overseas territories), hindering regular monitoring. Additionally, proprietary data processing software makes it difficult to ensure the accuracy of surveys relative to the actual condition of the pavement.

To address these challenges, the Laboratoire Essais et Expertise (L2E) within the Structures Adhérence department of STAC, in partnership with the Université Gustave Eiffel (UGE) and ADP, decided to develop its own high performance, low-cost distress survey method. In the project initial phase, a system equipped with industrial optical cameras was validated. This year, the L2E has gained autonomy in developing artificial intelligence (AI) models, thanks to acquiring machines dedicated to training deep learning models, and completing a PhD thesis on machine learning robustness. While several supervised learning models for crack detection and segmentation have already been developed, L2E is exploring generative models capable of identifying diverse types of degradation under varying conditions, while reducing the cost of image annotation.

Simultaneously, the L2E conducted an image collection campaign at the air base 118 in Mont-de-Marsan. These images will be added to data gathered from other platforms for model training. During this campaign, the 25e régiment du génie de l'air, entity from the Ministry of the Armed Forces also performed manual distress surveys at the same site in Mont-de-Marsan. This will allow a comparison and validation of the various AI models developed by L2E, UGE, and ADP against manually recorded distresses data.



# Biodiversity and Sustainable Development

# Studies and Research

## CARBON SEQUESTRATION EXPERIMENT AT FRANCAZAL WITH EGIS

The herbaceous cover experiment, launched at the end of 2023, continued throughout 2024. The first surveys were carried out on the different types of sown grassland being monitored. The produced indicators cover various areas, including biodiversity, animal risk and carbon sequestration.

For the first two areas, the indicators are based on various participatory science protocols that enable botanical and zoological surveys. For carbon sequestration, STAC collaborated with EGIS, who conducted an initial measurement campaign on the various experimental plots.

These indicators will be monitored over a number of years to assess the impact of the extensive management of airport green spaces and advance knowledge for infrastructure managers everywhere.

# EN-ICCA, A EUROPEAN GROUP DEDICATED TO CLIMATE CHANGE IN AVIATION

In 2024, the EN-ICCA group (European Network on Impact of Climate Change on Aviation), launched in 2023 by the European Aviation Safety Agency (EASA), continued its work to better understand and anticipate the effects of climate change on the safety of flight operations. The STAC is taking part in this work alongside the DSAC's Safety Assessment and Improvement Mission.

After prioritising the phenomena to be studied, the tasks relating to in-flight icing and extreme convective phenomena began in 2024.

# AIR QUALITY IN THE EUROPEAN OLGA PROJECT

The STAC is involved in several working groups within the European OLGA (hOListic Green Airport) project. In particular, it is involved in the progress of WP6 "Cross-cutting aspects", the primary objective of which is to develop a methodology for assessing air quality in real time using a fully integrated monitoring and modelling platform.

The idea of this working group is to theoretically identify the sources of pollution on and around an airport and to quantify the emissions from these sources through measurements. This data is then sent to an interactive data exchange platform where it is formatted. The data can then be used by a modelling tool to simulate pollutant emissions and concentrations in and around the airport in real time or for long-term scenarios. The data can be viewed via an interactive dashboard and the user can modify the desired scenarios.

These tools, which have been made available to the airports of Paris, Zagreb, Cluj and Milan, help to better assess the trade-offs to be made between pollutant emissions and the noise generated by the airport.

# ULTRAFINE PARTICLE MEASUREMENT CAMPAIGN

## At Toulouse-Blagnac airport

From April to December 2023, STAC carried out an ultrafine particle (UFP) measurement campaign at Toulouse-Blagnac airport. The objectives of this campaign were to carry out an inventory of the levels of UFP encountered on the platform, to determine the types of sources responsible for their emissions and to monitor their dispersion as a function of meteorological conditions.

The measuring device consisted of a Partector 2 manufactured by the Swiss company Naneos, mounted on a 2-meter high mast and powered by an external battery recharged by a solar panel (see photo). This was a stand-alone measuring device that could easily be moved around the platform to take readings close to the various sources of emissions present in the airport area. The data was recorded every second and included the number of particles per cm3, for sizes ranging from 10 to 300 nanometres, as well as the average size of the PUFs measured.

Ten measurement points were chosen in consultation with Toulouse-Blagnac airport to position this measurement device in order to obtain concentration levels representative of the main activities present on the platform (ground handling, taxiing on taxiways, approach and take-off on runways). As a general rule, PUF levels measured near aircraft parking areas were higher than those measured near taxiways and runway thresholds. This can be explained by the presence of a large number of emission sources in these areas (idling aircraft, use of the APU, special equipment). A correlation was also found at all the measurement points between the average daily profiles representing changes in PUF levels and airport activity by hour.

A second measurement campaign is scheduled to start in 2025. The measurement system will be supplemented by a CPC (Condensation Particle Counter) and a SMPS (Scanning Mobility Particle Spectrometer). The latter will make it possible to obtain particle levels by size range, making it possible to determine more precisely the types of sources responsible for their emissions.

# PAVEMENT STREAMLINED MONITORING

## Ground Zero study - Evreux and Mont-de-Marsan Airforce bases


The Airfield Pavement department launched 2018 a working group dedicated to asset management in collaboration with the SNIA and the Ministry of the Armed Forces. In 2020, a roadmap was established concerning so named Pavement Streamlined Monitoring project, aimed at optimizing the monitoring of airfield pavement conditions. Within this framework, two Airforce bases have been selected (BA105 of Evreux-Fauville and BA118 of Mont-de-Marsan), based on the structural characteristics of the main runway, the type of traffic received and the weather conditions specific to their geographical locations. The goal of the project is to carry out a comprehensive pavement evaluation and thus determine the optimal frequency and sequence for these tests.

The working plan included, for the ground-zero test campaign , the following tests: ground-penetrating radar (GPR), core sampling, distress identification (using two methods: manual with a condition index calculation and automated with a low-cost camera device), pavement bearing capacity with Heavy Weight Deflectometer (HWD), subgrade bearing capacity (using dynamic plate tests, dynamic penetrometer and CBR). These were conducted from the fall of 2022 to the spring of 2023 on the Airforce base BA 105 of Evreux, focusing on the main infrastructures, namely: the runway, the taxiway alpha and the aprons taxiways (all of which are flexible pavements). In 2024, HWD tests were conducted on the Airforce base BA118 of Mont-de-Marsan, which consists of rigid pavements. The results obtained, particularly the residual modulus of the pavement layers' materials, are essential for calculating the Pavement Classification Number (PCN) or Pavement Classification Ratio (PCR). Furthermore, they will serve as a reference for monitoring measurements and assessing the evolution of the mechanical characteristics of the material layers. It is worth noting that the study on the BA118 also helps to confirm the robustness of the evaluation method for rigid pavement developed by the STAC.

The task now involves conducting regular monitoring of the inspected pavement by performing distress survey and HWD tests. This will be carried out through two annual test campaigns at each of the two selected sites, one in spring/summer (warm temperatures) and the other in fall/winter (cold temperatures).

## Characterisation of materials from the STAC experimental test facility (FEREC 2022)

The Airfield Pavement department continues its commitment to more environmentally friendly airfield pavements through its research program aimed at increasing the proportion of Reclaimed Asphalt Pavement (RAP). In 2022, the construction of a test facility pavement incorporating high rates of RAP was completed. Since then, the project has sparked considerable interest within the community, leading the STAC to formalize its collaboration with the company Eiffage, partnership which won the consultation for this construction. Thus, the STAC and Eiffage initiated the AERICA project (RAP for Aeronautical Pavement). This project was an award winner of the 2022 call for proposals by the FEREC corporate foundation, focusing on the topic "Decarbonizing Construction and Infrastructure Maintenance: Products, Processes, and Equipment."

Since then, extensive campaigns of material characterization extracted from the pavement have begun. Led by different laboratories, including Eiffage laboratory (France), University of Parma laboratory (Italy), University of New Hampshire laboratory (USA), LTDS of ENTPE-University of Lyon (France), Federal Aviation Administration (USA) and Université Gustave Eiffel (France) laboratories, these cross-tests have mainly focused on fatigue performance and material modulus. The initial results obtained in 2024 highlighted similar performances between the formulations (with and without RAP). Moreover, the moduli and fatigue resistances obtained conformed to the requirements of the NF EN 13108-1 standards and were particularly high for the basic formulation (without RAP). These results validated the formulation selections made by the STAC.

This project will continue in 2025 with the finalization of laboratory characterization tests and the full-scale fatigue tests campaign.

## Temperature Instrumentation of a Taxiway in Orly

As part of the collaboration with ADP's laboratory, the Airfield Pavement & Friction department installed temperature sensors in the rigid pavement of the taxiway W22 at Orly airport in July 2024. Monitoring the temperature evolution and studying the temperature gradient within the pavement structure will provide a better understanding of the global behaviour of rigid pavement. This knowledge will support the development of reliable models to challenge the new climate conditions.

Indeed, airport pavements are highly sensitive to the impacts of climate change, such as rising average temperatures, intensified extreme weather events, and increased day/night temperature variations. These phenomena must be taken into account in pavement design and management to prevent accelerated damages.

The initial results of this study were presented in April 2025, at the Passenger Terminal Exposition, in Madrid. Furthermore, the instrumentation of a flexible pavement at Orly airport is planned for 2025. Monitoring the temperature within the flexible pavement structure will support the adaptation of the equivalent temperature value—an essential parameter in the rational design method—to the phenomena at stake. This approach aims to strengthen infrastructure resilience by evaluating the impacts of climate change with a view to adapting future designs and/or adopting appropriate measures.

# Standardization and Regulation

## CONTRIBUTION TO INTERNATIONAL WORK

The STAC participates in several working groups (WG) of the Committee on Aviation Environmental Protection (CAEP) of the ICAO and of the European Civil Aviation Conference (ECAC), particularly in the areas of pollutant emissions, noise and climate change. The year 2024 was marked by preparations for the CAEP/13 meeting, which was held in February 2025 in Montreal.

During the last CAEP cycle, STAC contributed to the following WGs:

- WG2 Airports and Operations for the update of the document "2018 ICAO Climate Adaptation Synthesis", which presents a compilation of information on the impacts of climate change on airports and adaptation measures for the global aviation sector.
- WG3 on emissions, with proposals to develop existing standards for NOx and nvPM (where the representativeness of current certification data, based on the LTO cycle covering climb, cruise and descent phases), but also for the development of standards for pollutants and CO2 (which will apply to the future Overture supersonic business jet developed by the Boom company).
- Modelling and Databases (MDG) to carry out modelling of environmental trends in noise and emissions up to 2070, as well as modelling of the different scenarios for defining the dual noise and CO2 standard.

STAC also contributes to ICAO's Wildlife Hazard Management Expert Group (WHMEG), which is currently updating Doc 9137, Doc 9981 and Annex 14 (Volume I) to ensure consistency in the terminology used in wildlife risk management.

In 2024, it also joined the UN Flight Safety Task Force of the European Goose Management Platform, whose main objective is to coordinate the implementation of actions aimed at reducing the risks posed by geese in terms of aviation safety.

The STAC is also involved in ECAC's work on the MDG. As such, it contributes to the Alliance for Zero Emission Aviation (AZEA), in particular to the WG on forecasting hybrid, electric or hydrogen-powered aircraft (and helicopter) fleets by 2030-2050.

In 2024, it also joined the SAE G-12 working group dealing with products applied during de-icing of aircraft on the ground.

# MEASURING APU UPTIME

The APU (Auxiliary Power Unit) is a turbojet engine located at the rear of the aircraft fuselage, which supplies electricity, air conditioning and compressed air to start the engines when the aircraft is on the ground. It also relieves the load on the main engines during take-off by providing air conditioning and acting as a back-up engine in the event of an in-flight failure.

According to data on commercial aviation emissions from the TARMAAC calculator (Traitements et Analyses des Rejets éMis dans l'Atmosphère par l'Aviation Civile - Processing and Analysis of Emissions into the Atmosphere by Civil Aviation), the share of CO2 emissions represented by APUs at an airport is significant, and even more so for those handling more short-haul flights. At Toulouse Blagnac airport, for example, APU emissions account for 2.49% of the aircraft's total emissions (LTO+ ½ cruise+ stopover), 12.37% of emissions during an LTO cycle and stopover, and 34.29% of emissions on the ground.

Significant energy savings are possible by using alternative means such as powering the aircraft with 400 Hz or using the air conditioning supplied by the airport.

A new regulation concerning the use of APUs during stopovers came into force on 1 December 2023 at Bâle-Mulhouse, Bordeaux, Lille, Lyon, Marseille, Nantes, Nice, Paris-Beauvais, Paris- Charles de Gaulle, Paris-Le Bourget, Paris-Orly and Toulouse airports. It aims to make the use of alternative means compulsory and to limit the use of APUs to 10 minutes before departure and 5 to 10 minutes after the aircraft's arrival at the parking point.

For several years now, STAC has been conducting research into operational methods for monitoring APU uptime at stopovers to assist the air transport police.

In 2023 and 2024, the STAC carried out a measurement campaign at Toulouse Blagnac airport to evaluate the use of thermal cameras to monitor the time spent using APUs during ground handling. These measurements, carried out on the majority of aircraft models present on the platform on a daily basis and in different spatial and meteorological configurations, are rather encouraging in terms of the technical feasibility of using thermal cameras to monitor aircraft on the ground.

In 2025, the experiment will continue with tests of automated processing using fixed cameras at Toulouse Blagnac.

# Implementation in application

## BIODIVERSITY DISCOVERY DAY AROUND STAC TOULOUSE

### Call for biodiversity projects: 'Our nature, our solutions'

In March 2024, the French Ministry for Ecological Transition launched a call for biodiversity projects called 'Our nature, our solutions' as part of the 'Eco-responsible Public Services' initiative.

STAC Toulouse responded to this call, proposing an awareness-raising initiative for its employees. As part of this initiative, which took place in September 2024, employees were able to discover the surrounding biodiversity and learn the basics of species identification and participatory science protocols, with the help of two naturalists (an ornithologist and a botanist) from the Nature en Occitanie association.

STAC employees were able to immerse themselves in the richness of the Touch wetland in the immediate vicinity of their workplace, learning about both ordinary and heritage species. Accompanied by experts, they became aware of the importance of preserving these ecosystems in a dense urban environment.

# CALIPSO V2.0

In the year 2024, a major change has been made to the CALIPSO protocol with the publication of the decree of 17 July 2024 on the Classification of Light Aircraft according to their Noise Performance Index. This text repeals and replaces the decree of 13 June 2013, which introduced this classification.

A new "A+" class has been created to reflect the performance of the latest light aircraft used on general aviation platforms. The threshold between classes A+ and A has been set at a performance index value of 90 in order to respect the 30 IP point "step" between each class, and will enable the most acoustically efficient light aircraft to be classified more accurately.

The STAC acoustics laboratory took account of this new decree as soon as it was published when carrying out acoustic measurements. This CALIPSO classification enables light aircraft of the CDN, CNSK and CRNA types to be compared according to their noise performance index on laps around the runway. The higher the performance index, the quieter the aircraft. It is used by various general aviation airfields, by means of an operating decree or a local charter, in order to regulate, during certain time slots, the traffic around the runway according to the noise performance of the aircraft. This is the case at Paris-Saclay-Versailles (formerly Toussus-le-Noble), Cannes-Mandelieu, Aix-les-Milles, Chavenay-Villepreux, Lognes-Emerainville, Lyon-Bron, Montpellier Méditerranée, etc.

The MACOUS laboratory carried out CALIPSO measurements at 5 sites: Aubenas-Ardèche méridionale, Mauléon, Castelsarrasin Moissac, Montargis-Vimory, and Montceau les mines/Pouilloux. These campaigns made it possible to measure 15 aircraft in accordance with the protocol and to carry out 6 type noise certification measurements for new aircraft in accordance with the ICAO Annex 16 protocol.

Le classement CALIPSO de ces avions est consultable sur l'application web :

https://calipso.dta.aviation-civile.gouv.fr/application-externe/

# BIODIVERSITY IN THE FIELD OF WILDLIFE RISK AND BIODIVERSITY MANAGEMENT





In 2024, the Environment Division's Animal Risk and Biodiversity Management subdivision continued to make technical documentation available to all airport stakeholders.

Several publications on biodiversity were added to the collection:

- The English-language version of the technical guide to mowing green spaces at airports was distributed, and an executive summary of the document was published online.
- To make it more accessible: The creation of a series of technical fact sheets on various themes, such as pollinators, beehives, insect hotels and eco-grazing. The intention is for this series to gradually expand to include new issues of concern to airport operators.

In the field of wildlife risk management, the annual statistical bulletin will continue to provide an overview of the major trends in 2023, focusing on specific events.

# THE INDICATEUR GLOBAL MESURE PONDERE (IGMP) 2023

The decree of 28 January 2003 defines the IGMP, an indicator representative of aircraft noise energy at Paris - Charles de Gaulle, with a limit based on average levels from 1999 to 2001. Calculated by the STAC since 2007, the 2023 IGMP reaches 57.1 (+5.3 points compared with 2022), mainly due to an 11% increase in air traffic. Presented to the ACNUSA commission at the end of 2024, the indicator received a favourable opinion, confirming its conformity and its role in noise management at the airport.

# Monitoring

## ENVIRONMENTAL NOISE MEASUREMENTS AT AVIGNON

Aviation activity at Avignon-Provence airport is causing growing concern among local residents and elected representatives, due to noise pollution.

DSAC-SE commissioned the STAC acoustic laboratory to carry out measurements to quantify these environmental impacts. Over a one-month period, measurements were taken at 4 sites representative of all activities at the airport.

The results, expected in 2025, will make it possible to assess the noise impact of these activities.

## ENVIRONMENTAL ACOUSTIC MEASUREMENTS OF GLIDER NOISE

The French Gliding Federation (FFVP) requested the French Civil Aviation Authority (DGAC) to assess the acoustic impact of gliders, particularly within natural parks. The aim of this initiative was to measure the acoustic signature of gliders and to analyze the influence of speed and altitude on the noise levels generated.

A measurement campaign was conducted in November 2024, and the results were presented in early 2025.

# ENVIRONMENTAL NOISE MEASUREMENTS ON REUNION ISLAND

To assess the noise pollution caused by air traffic on the island of Reunion, DSAC-OI commissioned the STAC acoustic laboratory.

For 3 weeks, 3 technicians carried out acoustic and meteorological measurements at 9 sites across the island. All aircraft, particularly helicopters, reported as annoying by local residents, were measured.

The aim of the study, the results of which are expected in 2025, is to assess the impact of noise and encourage authorities to reduce nuisance.

# VULCLIM

The French government is developing its climate change adaptation strategy with the Trajectoire de Réchauffement de Référence pour l'Adaptation au Changement Climatique (TRACC) and the third part of the Plan National d'Adaptation au Changement Climatique (PNACC).

The former sets out a common framework for the emissions scenario to be considered in adaptation studies, while the latter outlines concrete measures to be implemented, particularly with regard to adapting transport infrastructures.

In response to these developments, STAC has updated its VULCLIM tool for the preliminary diagnosis of the vulnerability of aerodromes to climate change. This update was carried out in close collaboration with Météo France, enabling specific indicators to be produced in response to the new climate projections resulting from the TRACC.

Over the coming years, the STAC will continue to collaborate with other DGAC departments, Météo France, and the UAF and FA to provide airport operators with the best possible support in their adaptation efforts.

# WILDLIFE RISK ASSESSMENT AT AIRPORTS

The STAC is mandated by the DSAC to evaluate the management of wildlife risk at French airports.

For this purpose, at least two civil airports are visited each year. In collaboration with the Air and Space Force Headquarters, the STAC conducts the same analysis at two air bases annually.

In 2024, STAC agents visited Biarritz-Pays Basque and Lille-Lesquin airports. They also visited Dijon-Longvic airport, which recently established a dedicated animal risk prevention service. The air bases at Évreux-Fauville (105) and Saint-Dizier (113) were also inspected.

During an wildlife assessment, the following are assessed: wildlife risk management documentation and procedures; airport environment management practices; and wildlife presence monitoring protocols.

Following this analysis, recommendations and courses of action are proposed to help aerodrome operators implement their wildlife risk management program.

# Safety

# Studies and Research

## OPERATIONAL FRICTION CAMPAIGN IN CANADA

From January 16 to 23, 2024, STAC's Runway Safety Division and Expertise testing laboratory conducted a research campaign on winter contaminant adherence at Montreal Mirabel airport, entitled Friction Winter Research and Correlation of Equipment 2024 (FWRCOREQ24). This campaign follows on from the one carried out in January 2023 at the Mont-Dauphin-Saint-Crépin aerodrome (Hautes-Alpes).

It focused on several research themes. In particular, the aim was to identify ranges of skid resistance by type of winter contaminant, as defined by the Global Reporting Format (GRF), and to estimate the corresponding aircraft braking performance. The relationship between skid resistance measurement devices in winter operating conditions and the effectiveness of surface treatment techniques was also studied. This work feeds into a multi-parameter skid resistance calculation model currently under development, which aims to link skid resistance measurement, GRF description and aircraft performance.

This work is the fruit of collaboration between Aéroports de Paris laboratory, the Chicoutimi Québec university and the Université Gustave Eiffel. The stability of Canadian winter conditions and the expertise of Montreal Mirabel airport's winter maintenance teams meant that contaminated surface conditions similar to those encountered by aircraft were sufficiently repeatable and homogeneous for this applied research. The various contaminants studied were slush, dry snow, wet snow, compacted snow and ice. Various speeds and braking forces were tested to capture the complex variations in grip on a contaminated runway. The final database contains over 1000 valid and repeatable observations.

The modelling work carried out on the basis of the observations had to address two interrelated issues. The first was to predict the coefficient of longitudinal friction (CFL) from speed, braking rate and contaminant. A second model targeted the classification of RWYCC (Runway condition code) or the contaminant present from the measured CFL. The use of machine learning was a key element in this modeling work, in order to obtain high-performance models that were consistent with the measurements taken. Measuring the difference between longitudinal friction coefficients in terms of force and torque, using IMAG, brought a considerable improvement in the performance of the classification model ($R^2 = 0.84$).

This model should now be transposed as a decision-support tool to complement GRF-related runway inspections. It could be tested under operational conditions at Paris airport.

# STUDY ON CFMD DEVICES MEASUREMENT DEVIATION

As part of the ongoing work on updating airport safety regulations, the laboratory of STAC has launched at the request of the Civil Aviation Safety Directorate, a study on the drift of adhesion measurement equipment (CFME). This study will first aim to estimate the required maintenance and certification intervals. It will also contribute to the effort of capitalizing on the knowledge acquired within the laboratory.


# ACQUISITION OF A TRIBOMETER FOR LABORATORY STUDIES RELATED TO AIRPORT RUNWAYS

At the end of 2024, SA department acquired a tribometer to conduct laboratory studies on the intrinsic characteristics of airport pavements. This type of laboratory machine is designed to replicate the contact between two surfaces, in this case, the pavement-rubber interface.

This machine will enable the study of the various phases of aircraft landing for a range of aircraft types (with varying loads and speeds) while controlling environmental conditions, including temperature, humidity, and the presence of contaminants in the contact area (water, formates, ice/frost, sand, etc.). As such, it complements the friction measurement devices currently used by STAC on its studies.

The studies will focus both on factors influencing adhesion/grip and on material wear phenomena in pavements due to traffic. These studies can be made in conjunction with external research projects addressing diverse topics (sustainability, surface layer maintenance strategies, safety research, etc.). They will be carried out either internally or in collaboration with scientific partners (UAF, Gustave Eiffel University, industrial stakeholders).

# STUDY ON TAXIBOTS

Between now and 2030, the Groupe ADP wants to deploy a fleet of TaxiBots at the CDG hub, dedicated to towing medium-haul aircraft on departure, in order to decarbonise the taxiing phase while maintaining a satisfactory operational speed.

This deployment is partly constrained by the current configuration of CDG service roads which, without significant adaptation work, would greatly complicate the empty return trip of the TaxiBots, which are wide and relatively difficult to manoeuvre. To solve this issue, the Groupe ADP group is considering using the aircraft taxiways, which are the responsibility of air traffic controllers, for at least part of the return trip.

In 2024, Air Navigation Services commissioned the Airport Capacity team of the Safety, Performance and Planning division to study the impact of such a deployment on the workload of ground controllers.

After meeting the teams of Groupe ADP in charge of the project, the STAC set out to simulate, as representatively as possible, the operations linked to the use of TaxiBots, in particular the disconnection steps and the process of allocating fleet equipment to eligible aircraft. This projected use of TaxiBots has been integrated with a complete modelling of the infrastructure and aircraft procedures at CDG using the CAST Aircraft accelerated-time simulator.

In order to objectively assess the impact of the deployment of TaxiBots on the workload of ground controllers, the STAC has worked on developing a specific calculation method based on comparisons between real and simulated traffic samples, taking into account in particular the number of aircraft controlled simultaneously, transfers from one control zone to another, the complexity of the sequence of departures, the resolution of trajectory conflicts between two mobiles and the facilitation of the path of aircraft towed offshore.

# INTERMINISTERIAL ACTION PLAN ON ETERNAL POLLUTANTS

In response to growing concerns about the impact of per- and polyfluoroalkylated substances (PFAS) on human health, an interministerial action plan was launched in April 2024.

As part of this plan, at the request of the French Air Transport Authority (DTA), the STAC conducted a survey in 2024 of past and current use of fluorinated fire-fighting foams by the Aircraft Rescue and Firefighting Services (ARFF) at airports.

Moreover, at the end of the year, the Equipment Division coordinated the collection of samples from the last airports still using or holding these products in order to contribute to BRGM's work on the PFAS present in fire-fighting foams.

# ICAO REGULATORY WORK ON AERONAUTICAL VISUAL AIDS

The Equipment Division from the STAC takes part in ICAO's Visual Aids Working Group (VAWG) and acts as rapporteur to the Aerodrome Design and Operation Panel (ADOP). The VAWG is responsible for the development of standards, recommendations and guidance material in the field of aeronautical visual aids. The last meeting was held from 7 to 11 October 2024 in Vienna, Austria. It enabled the following work to be initiated (which is currently continuing):

- Definition of the framework (job card) needed to create specifications for the implementation of innovative technologies for the power supply of the lighting system. These technologies will make it possible to reduce its environmental impact as well as its design, installation, operation and maintenance costs, while increasing its reliability.
- Definition of a job card required to create specifications for the design, marking and lighting of dual taxiways.
- Work on the job card ADOP.029 (Aerodrome Maintenance Programme): review, analysis and updating of the provisions relating to the maintenance of aeronautical visual aids in the following documents following documents: Doc. 9 137 (Aerodrome Services Manual), Doc. 9 157 (Aerodrome Design Manual), Annex 14 - Volume I (Aerodrome Design and Operations) and Doc. 9 981 (Procedures for Air Navigation Services - Aerodromes).

# UPDATE OF THE LIGHTING MAINTENANCE GUIDE

In May 2024, an update of the maintenance guide for aerodrome power supply and lighting was published on the STAC website. The changes made were mainly editorial in order to produce an English version of the guide. The two versions (French and English) were put online simultaneously. The part concerning the maintenance of PAPI units has also been revised in order to respond more effectively to the needs identified at aerodromes during assessment work carried out by the Equipment Division in collaboration with the DSAC or airport operators.

# GUSTAVE EIFFEL UNIVERSITY STUDY ON GLARE FROM PHOTOVOLTAIC PANELS

Photovoltaic panels in the vicinity of aerodromes introduce notions of discomfort glare and incapacity glare for pilots or air traffic controllers.

With this in mind and starting in 2023, the Equipment Division of the STAC has got in contact with Gustave Eiffel University to carry out a study to characterize this glare.

Firstly, a literature review was carried out in early 2024 to clarify the concepts of visibility, discomfort glare and incapacity glare, eye damage and recovery glare (recovery of full visual capacity after glare).

Visibility levels with and without glare were then modelled for both the pilot's and air traffic controller's viewpoints.

The deliverables provided in November 2024 were presented in the form of abacuses expressing the level of visibility as a function of illuminance to the eye and the eccentricity of the photovoltaic panel fields.

This work did not enable threshold values for incapacitating glare to be defined. Further work could be carried out to define such values and produce abacuses adapted to a given aerodrome.

# Standardization and Regulation

## REVISION OF ICAO AIRPORT SERVICES MANUAL, PART 2 ON PAVEMENT SURFACE CONDITIONS


The Airport Services Manual, Part 2 – Pavement Surface Conditions (Doc 9137), compiles best practice recommendations and tools necessary for assessing and reporting runway surface conditions. However, this document, intended for aerodrome operators, air navigation service providers, and air operators, has not been updated since 2002. The Airport Services Manual, Part 2 is no longer aligned with the evolution of regulatory texts, particularly following the new Global Reporting Format (GRF) for runway surface conditions, which came into effect in 2021.

The revision of the manual has been delegated to the Friction Task Force, an ICAO working group responsible for addressing issues related to runway surface friction and the safety of aircraft ground movements. The upcoming version will incorporate and replace the existing ICAO Circular 355 on the assessment, measurement and reporting of runway surface conditions following the GRF methodology, in force since November 2021.

This revision also provides an opportunity to review and delve deeper into the monitoring of pavement-intrinsic characteristics related with the safety of aircraft ground movements, as well as to update the tools and methods used to measure these characteristics.

# PARTICIPATION OF S2P STAFF IN ICAO INTERNATIONAL GROUPS

The S2P division is actively involved in revising aerodrome obstacles limitations surfaces and the various physical characteristics of aerodromes. The team is also involved in heliports, vertiports and, since this year, altiports.

In the field of airport operations, the division contributes to the GHTF working group on ground handling and to the A-SMGCS group (ground surveillance system). It is also working on CDM (Collaborative Decision-Making), a concept designed to enable the efficient exchange of information between the various players involved in airport operations, for smoother management of operations.

# STUDY ON THE LANGUAGE SKILLS OF MANOEUVRING AREA DRIVERS

Requirement ADR.OPS.B.029 of Regulation (EU) No. 139/2014, as amended, stipulates that all staff holding a driving licence on the manoeuvring area of European certified aerodromes must provide evidence of a satisfactory level of English, at least operational level, i.e. at least level 4 according to the ICAO.

In this context, the STAC has conducted a study between 2022 and 2024, in accordance with AMC1 ADR.OPS.B.029(g), to analyse the impact of the drivers of the vehicles mastering the English language at an operational level on the safety at French aerodromes with European certification.

This study includes consultation with aerodrome operators, AFIS (Aerodrome Flight Information Service) and ANSP (Air Navigation Service Provider) on the subject, supplemented by a report of on-site interviews with operators, vehicle drivers and air traffic controllers. In addition, an analysis of safety occurrences involving runway incursions by vehicle drivers was carried out, in order to categorise their causes.

A final consultation of operators, AFIS, LRST (Local Runway Safety Teams) as well as DSAC and DSNA is underway. Its results will be incorporated into the final report, which will be published in the second half of 2025.

# Implementation in application

## GUIDE TO THE PROVISIONS

### Perimeter protection

Airports are critical points in global air transport: they are exposed to a variety of potential threats, ranging from terrorism to other forms of crime. Perimeter protection plays a crucial role in preventing these threats, and is the first line of defence against unauthorised intrusion.

STAC's Security Division has drawn up a guide to perimeter protection devices. Feedback from demonstrations and evaluations of intrusion detection systems, or from experiments conducted as part of the Vision Sureté innovation programme, combined with existing literature, will enhance existing knowledge.

Produced in consultation with the DSAC and DTA departments, the guide aims to support current publications and standards. It aims to provide, on the one hand, a methodology for quantifying a level of risk and, on the other, best practices for guaranteeing the robustness of airport perimeter protection solutions. Finally, it presents a (non-exhaustive) state of the art of physical protection systems and intrusion detection devices.

# GUIDE ON SITES FOR HELICOPTER EMERGENCY MEDICAL SERVICES

A guide related to the planning and operation of sites used by the Helicopter Emergency Medical Service was published in the summer of 2024. This document incorporates all the new regulatory provisions, as well as a number of best practices to be implemented by hospital heliports operators.

# A NEW CALIBRATION BENCH FOR IMAG DEVICES

The measurement of runway skid resistance is an important element for safety. To improve the quality of these measurements by reducing associated uncertainties, the laboratory has launched a project to overhaul its calibration procedures for the devices dedicated to this measurement. This is being done through an upgrade of the equipment, including the design of a new calibration bench. In collaboration with the National Laboratory of Metrology and Testing (LNE), a prototype using innovative techniques, including the use of aerostatic bearings, has just been finalized and is expected to enter into its validation phase during the year. The goal is to obtain a calibration facility that complies with ASTM E556 standards and minimizes operator handling while reducing maintenance costs.

# Monitoring

## CERTIFICATION OF ATM/ANS AND AERODROME EQUIPMENT

Since the end of 2023, the new regulatory framework requiring the most critical ATM/ANS equipment to be subject to compliance standards and also requiring production by only approved manufacturers has been in force.

Under this framework, manufacturers must be granted a Design and Production Organisation approval (DPO) from EASA and have their products certified within 5 years. From EASA's point of view, processing these applications represents a new workload that must be absorbed in time. This is why it has called on the national authorities to support it in this task.

The STAC, together with the DSAC, responded to this appeal. The partnership agreement between the DGAC and the EASA is in the process of being amended on this subject. The STAC should devote one full-time equivalent to this mission, spread over four agents, from mid-2025.

In addition, EASA has begun work on the equivalent of this regulation for safety equipment installed on aerodromes. The Agency published an NPA in the summer of 2024 to gather comments from the Member States.

At the same time, EASA has set up working groups of experts to draw up certification specifications for equipment falling within the scope of this regulation.

## HELPING AIRPORTS MOVE TOWARDS FLUORINE-FREE FOAMS

In 2024, the EU strengthened the ban on certain per- and polyfluoroalkylated substances (PFAS) in fire- fighting foams, with a deadline of 2029 for airports and, ultimately, a ban on all PFAS. All European airports must therefore prepare to use fluorine-free foams, even though the vast majority of airports in France already use them. This year, the STAC organised an Emulsifier Information Day and drafted a selection guide to support the last French airports using fluorinated products and to help those already using fluorine-free products to improve their selection process. At European level, the STAC also led the work of experts appointed by EASA to identify and propose actions to facilitate the transition to fluorine-free products.

# AIRPORT LIGHTING ENERGY ACTIVITIES

In 2024, the "power-supply and lighting" subdivision carried out a total of nine expert assessments of airport lighting installations at the request of the supervisory authority (DSAC).

At least seven training sessions were also given, mostly in collaboration with the ENAC, for DSAC surveillance inspectors, airport operators and staff from the Ministry of the Defense.

Among other studies of innovative systems, the subdivision's staff have begun to develop their skills in photovoltaic technology for the drafting of a guide on the use of autonomous solar-powered lights on airport platforms.

Involvement in the development of standards in this field has been actively pursued with the AFNOR, CENELEC and IEC standards bodies.

Alongside all these activities, the subdivision responds daily to various queries from the DSAC, aerodrome operators and manufacturers regarding every issue relating to power supply and airport lighting.

# EVALUATION OF LIGHTING MONITORING SYSTEMS

The "power-supply and lighting" subdivision of the STAC has been commissioned by the DSAC to carry out an assessment of the lighting monitoring systems installed on French airports.

This analysis is part of a corrective action plan in response to a deviation notified by the European Union Aviation Safety Agency (EASA) in October 2023 concerning the non-compliance of an aerodrome with the design requirement CS ADR-DSN.S.890 Monitoring.

This requirement provides the monitoring of lighting on platforms operating in low visibility (below 550 m RVR) in real time via the installation of automated systems.

The assessment, which was delivered in September 2024, included an inventory of all the relevant airports in France, a description of the monitoring equipment available on the market and an analysis of the compliance of these systems with the European requirement.

# Security

# Studies and Research

## HELP KIT FOR LABORATORIES

### Biometrics, ETD, EDS, LEDS

As part of its surveillance activities, the Security Division, and in particular the Networks, Equipment and Systems (LRES) laboratory, carries out a four-yearly assessment of security equipment in operation at airports. This assessment consists of a documentary check and performance tests for most equipment. However, some systems do not have a test methodology. The Security Division has therefore worked on developing test kits for EDS / EDS CB and ETD.

Work on the ETD kit has been carried out jointly by MAI and LNE and should result in the design of a method that is both practical for agents and accurate for assessing the performance of trace detection equipment.

With regard to the EDS / EDS CB kit, the tool developed by the JRC (Joint Research Center, research centre of the European Commission) was an initial test which the division will use to develop an optimal solution.

# DEVELOPMENT OF A TEST CASE

## A tool for assessing the 3D image quality of X-ray analysis equipment for hold and cabin baggage


The STAC security laboratory participates in the ECAC's assessment of automatic explosives detection equipment in hold baggage (EDS) and automatic explosives detection equipment in cabin baggage (EDSCB). Among several other criteria, image quality is one of the critical aspects of this assessment. To date, a 2D imaging test tool has been used on an exploratory basis to check this image quality. Known as the "Exposed-wire standard test piece "(abr. EWSTP), this 2D imaging test tool is commonly used to verify compliance with European image quality requirements applicable to conventional radioscopic equipment. However, it is not suitable for the 3D images provided by the new generations of EDS and EDSCB.

Since 2017, ECAC has been working on the parameters/criteria to be verified for assessing the 3D image quality of equipment used for baggage screening. Drawing on its experience in radioscopic imaging, STAC drew up initial proposals for criteria applicable to EDS, and in 2020 was appointed expert and project leader for the implementation of a suitable tool. After three years of research alongside partners with expertise in X-ray imaging and equipment manufacturers, STAC has developed a 3D image quality assessment toolkit for EDS and EDSCB airport imaging equipment.

The prototype case was presented to the members of the ECAC Technical Task Force. The detailed plans and technical characteristics of the tool, as well as an image quality test methodology (with an appendix for reporting results and interpretation methods) have been sent to the members of the study groups concerned. They should help to develop European regulations and ECAC's EDS and EDSCB test procedures. Once validated by ECAC, the image quality performances will be included in the implementing regulation (EU) 2015/1998.

The STAC has also been working with the main manufacturers of recognised test tools to make the necessary adjustments for large-scale production of the case at a lower cost.

# UNIVERSITY PARTNERSHIP ON MATERIAL VALIDATION IN X-RAY MICRO-TOMOGRAPHY

The Biscarrosse STAC is a centre for the evaluation of explosive detection systems recognised by the European Civil Aviation Conference (ECAC).

These systems make it possible to view the contents of a baggage without opening it, using X-rays. The X-rays penetrate through the luggage exterior and produce an image. The density of the material is represented in grayscale, and the addition of voxels (three-dimensional pixels) reconstructs the shape of the luggage contents. The denser the object such as metallic material, the darker the voxel and vice versa. When a suspect or prohibited object is identified, a specific colour code indicates to the operator the type of threat.

Pyrotechnic threats can be military, civilian or what we call homemade. These are manufactured in the STAC chemistry laboratory. However, two of them are highly sensitive to physical impact. This is why the laboratory staff have developed a simulant for these two chemical compositions. The similarity is based not only on the physical aspect (liquid) but also and above all on its radioscopic characteristics.

The Biscarrosse STAC has an X-ray equipment (LEDS) which gives the two characteristics of the materials, the measured electron density and the Zeff, a parameter representing the “effective atomic number” of the material, which are the two main physico-chemical characteristics to be achieved when a simulant is developed. For a simulant to be validated, these two parameters must be within the RoR (Region of Responsibility), which is graphically translated in the plane of coordinates (Zeff, density) by a rectangular zone associated with a confidence interval.

To connect our LEDS to exact values in metrological terms, a scientific cooperation has been developed with the Université de Pau et des Pays de l'Adour (UPPA) and more specifically with the Imaging Laboratory on the Development of Methodologies.

Initially, the aim is to reproduce similar acquisition results. Using various measurement devices such as the Tescan UniTOM and Zeiss Xradia, D-meX will use reference materials with the dual-energy method and associated filters to acquire the data required for the study.

A programming stage will make it possible to use this data to reconstruct and convert the signals into digital values to estimate the study parameters.

The coding and initial results will then be consolidated by increasing the materials, energy levels and filters where necessary.

Once the study is sufficiently robust, a second phase will involve applying the methodology to standards and materials of interest to STAC to participate in the radioscopic characterisation of STAC simulants. At the end, after metrological connection, we will be able to qualify the various production batches of our chemical compositions.

# NEW LIQUID THREAT TEST METHODOLOGIES

The development of airport security technologies requires the adoption of more effective and efficient solutions. The deployment of EDS Cabin detection systems complying with standard C3 is part of this dynamic, increasing the level of security while ensuring faster passenger screening. This equipment allows cabin baggage to be inspected without having to empty it at the screening checkpoint, and authorises the carriage of liquids, aerosols and gels (LAGs) in quantities greater than 100 ml.

However, in tests carried out on EDS Cabins in the United States, some failed to detect high volumes of liquid threats. In view of these worrying results, the authorities have decided to maintain the current restriction limiting the carrying of LAGs to

100 ml per container. To remove these obstacles and guarantee effective detection, the liquid threat certification methodology needs to be revised.

The STAC (Laboratoire de Certification et d'Évaluation Pyrotechniques de Biscarrosse) was commissioned to contribute to the development of this new methodology, alongside the European test centres (United Kingdom, Netherlands, Germany, Spain and France), under the aegis of an ECAC working group. A first version of this methodology was discussed and validated in mid-2024. Its main objective is to broaden the assessment criteria by incorporating a greater diversity of volumes and containers, both in terms of material and shape, to ensure that detection systems are not limited to simple shape recognition.

The challenge is therefore twofold: to guarantee an optimum level of security while facilitating passenger flows. The development of these certification tests is a key step towards easing restrictions on LAGs, while ensuring reliable detection of potential threats.

# Standardization and Regulation

## SUPPORTING AIRPORTS IN MODERNISING CABIN BAGGAGE SCREENING


As airport security evolves in response to new threats and technological advances, optimising cabin baggage screening is a priority. To help French airports implement new technologies, particularly EDSCBs (Explosive Detection Systems for Cabin Baggage), STAC has drawn up a dedicated technical guide.

This document provides precise recommendations on adapting existing screening checkpoints, organising the passenger and baggage circuit and managing alarms. It is an essential resource for harmonizing practices and guaranteeing a high level of security while optimising the fluidity of controls. In addition, a digital PIF simulator has been developed to advise and assist airports in designing their lines.

Through this initiative, STAC is contributing to effective compliance and continuous improvement of security procedures, for the benefit of airports and passengers alike.

# Monitoring


## CONTROL AND SURVEILLANCE ACTIVITIES

### In the field of airport security

The STAC's monitoring activities, and more specifically those of the Réseaux, Équipements et Systèmes (LRES) laboratory, assist the DSAC.

The STAC assesses whether hold baggage screening systems (IFBS) comply with the requirements of French regulations, both upstream (16 requests for regulatory opinions processed in 2024) and during installation (10 on-site performance justifications in 2024, 14 planned in 2025), in order to help airports purchase and install these systems.

Since 2022, these activities have been extended to biometric access control systems (Nice in January 2025) and automated cabin baggage screening systems (Orly, Marseille, Nice and Lyon).

Finally, STAC continues to assess the performance of all security equipment installed at airport sites on a four-year cycle (18 CMPs in 2024).

# ODOROLOGY CONTROL CASE

Odorology is a method of securing a closed container by drawing in air and passing it through a filter, which is then presented to an EDD (explosives detection dog) to assess the presence of hazardous material.

This method has been in operation for several years and the dog teams using it are certified annually by the EDD team at the Biscarosse laboratory. However, the STAC safety division would also like to acquire a tool for monitoring the equipment used for air sampling, in order to assess its performance over time.

MAI therefore designed an air flow measurement suitcase in coordination with the EDD team. The suitcase is currently being tested in the field to ensure that the tool and associated procedure meet requirements. Once this stage has been completed, it will be delivered to the EDD laboratory in Biscarosse. If the suitcase is validated by the EDD team, then by the DSAC, it could be used for field checks.

# CERTIFICATION ACTIVITY

The Bonneuil-sur-Marne Security Laboratory carried out type certifications for security equipment. In 2024, it issued a total of 17 type certificates for security equipment and updated 13 TIP (Threat Image Projection) image banks for X-ray equipment.

This certified equipment, deployed throughout France, is inspected annually at the airport by the STAC according to a defined schedule

# CERTIFICATION OF DOG-HANDLING TEAMS

The pyrotechnic certification and assessment laboratory at Biscarrosse, which is responsible for certifying specialised explosives detection dog teams (CDE), ensured throughout the year that the teams complied with the required standards by organising tests and quality controls at the various sites where the teams were operating throughout France.

In 2024, 605 dog-handling certification tests were carried out at the Biscarrosse STAC site.

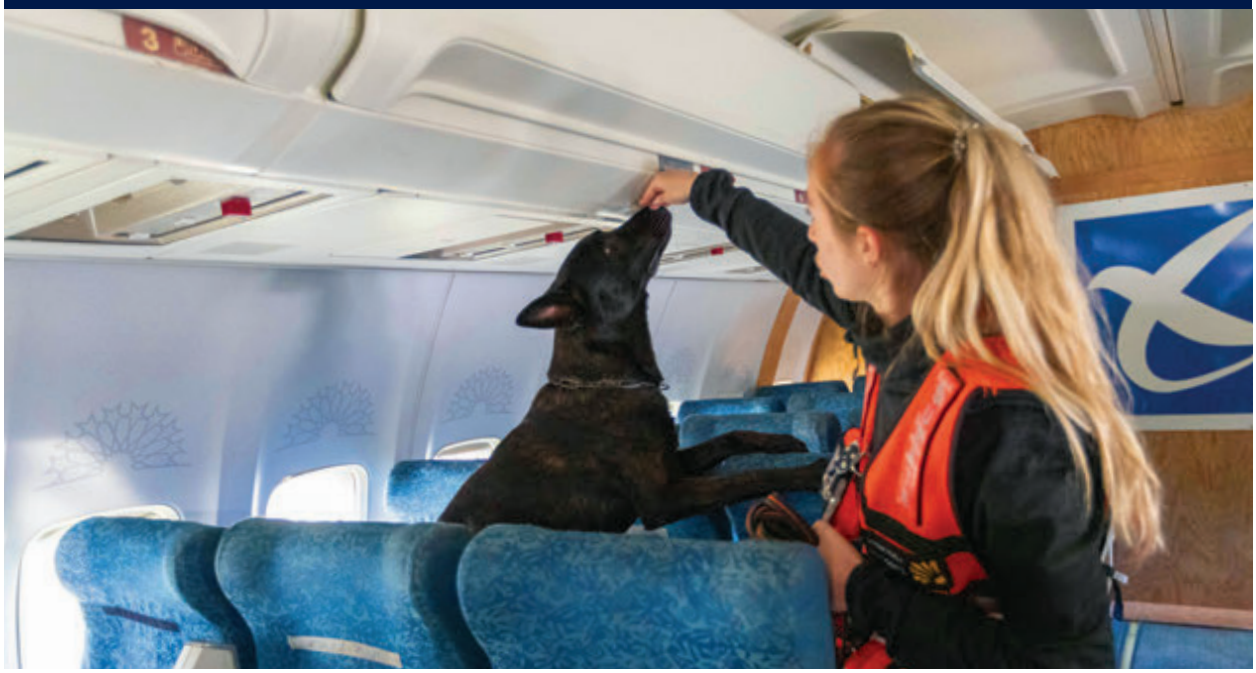
The overall success rate for the teams was 72%. This rate demonstrates the rigour and preparation of the agents, while highlighting the areas for improvement needed t o guarantee even better performance.

The laboratory has also granted certification to a new odorology company, and is conducting a number of experiments.

In addition to the new certification procedure coming into force at the beginning of the 2ndquarter of 2025, experiments will continue to test detector dogs in more complex environments, including:

- Securing in cold environments;
- Odour detection on various types of container.

The aim of these trials and the introduction of the new procedure is to improve certification methods to ensure that performance continues to improve.



# Our facilities


Photo modified by IA

# DEVELOPMENT OF APIDS SOFTWARE CERTIFICATION ACTIVITY

## Automatic detection of prohibited items in cabin baggage

Automating the detection of prohibited items in cabin baggage has been a major issue in recent years. To meet this need, several manufacturers have developed software and now wish to have it certified, a compulsory condition for being authorised to deploy it at screening checkpoints.

Numerous studies carried out by the STAC in conjunction with European test laboratories, coupled with trials at several strategic airports (Lyon Saint-Exupéry in France) have led to the inclusion of this new type of security equipment in European regulations (Commission implementing regulation (EU) 2015/1998).

At the same time, STAC participated in the definition within ECAC of a new common test methodology (CTM) for this technology. At present, only one laboratory in Europe is capable of implementing this methodology. To anticipate the imminent influx of requests for certification, STAC has positioned itself as a test centre. In 2024, the Security Division therefore began work on setting up a specific laboratory to implement this methodology, by adapting its infrastructure and procedures to carry out these new missions.

Photo modified by IA

# Glossary

## A

**ACNUSA**
Airport Nuisance Control Authority

**ADP**
Aéroports de Paris Group

**AESA**
European Union Aviation Safety Agency

**AFIS**
Aerodrome Flight Information Service

**AIT**
Transport Innovation Agency

**APIDS**
Automated Prohibited Items Detection System

**APU**
Auxiliary Power Unit

**ASTM International**
American Society for Testing and Materials

**ATM/ANS**
Air Traffic Management

## B

**BNAE**
French Aeronautics and Space Standards Board

## C

**CAEP**
Committee for Aviation Environmental Protection

**CALIPSO**
Classification of light aircraft according to their noise performance index

**CDE**
Explosive Detection Dogs

**CEAC**
European Civil Aviation Conference

**CEN-CENELEC**
European Committee for Electrotechnical Standardisation

**CEP**
Pyrotechnic Certification and Evaluation

**CFL**
Coefficient of longitudinal friction

**CMP**
Control of Performance Maintenance

**COFRAC**
French Accreditation Committee

## D

**DCSID**
Central Directorate of Defence Infrastructure Services

**DGAMPA**
Directorate-General for Maritime Affairs, Fisheries and Aquaculture

**DGITM**
Directorate-General for Infrastructure, Transport and Mobility

**DPO**
Design or production organisation

**DSAC**
Directorate of Civil Aviation Safety

**DSNA**
Directorate of Air Navigation Services

**DTA**
Directorate of Air Transport

## E

**EASA**
European Union Aviation Safety Agency

**EUROCAE**
European Organisation for Civil Aviation Equipment

**EDS**
Explosives Detection System

**ENAC**
French National Civil Aviation School

**ESSOP**
Environment, Systems and Operations Safety, Planning

**ENTPE**
National School of Public Works

**EUROCONTROL**
European Organisation for the Safety of Air Navigation

## F

**FAA**
Federal Aviation Administration

**FS**
Specialised training in health, safety and working conditions

## G

**GRF**
Global Reporting Format

I

**ICAO**
International Civil Aviation Organization

**IEC**
International Electrotechnical Commision

**IEEAC**
Civil Aviation Engineering and Operations Engineer

**IESSA**
Electronics engineer for aviation safety systems

**IFBS**
Hold Baggage Screening

**IMAG**
Automatic slip tester

**IPEF**
Forestry and Waterways Engineer

**ITPE**
Government Public Works Engineer

**ISO**
International Organization for Standardization

L

**LEDS**
Liquid Explosives Detection System

**LRST**
Local Runway Safety Team

**LTO**
Landing/Take-Off

N

**NOx**
Nitrogen oxides

**NvPM**
Non-volatile Particulate Matter

O

**OLGA**
hOListic Green Airport

P

**PAPI**
Decision Approach Path Indicatorr

**PCN**
Pavement Classification Number

**PCR**
Pavement Classification Rating

**PSNA**
Air Navigation Service Provider

R

**RTCA**
Radio Technical Commission for Aeronautics

S

**SAE International**
Formerly Society of Automative Engineers

**SESAR JU**
European Sky ATM Research Joint Undertaking

**SID**
Service d'infrastructure de la Défense
(French Ministry of Defence)

**SMQ**
Quality Management System

**SNIA**
National Airport Engineering Service

**SMUH**
Helicopter Emergency Medical Service

**SSLIA**
Aircraft Rescue and Firefighting Service

T

**TSEEAC**
Technicien supérieur des études et de l'exploitation de l'aviation civile (Senior civil aviation studies and operations technician)

**TSDD**
Senior Technician in Sustainable Development

U

**UAF**
Union of French Airports and Associated Francophone Airports

V

**VAWG**
Visual Aids Working Group

W

**WHMEG**
Wildlife Hazard Management Expert Group

# Notes

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