BEA80

Bureau d'Enquêtes et d'Analyses pour la sécurité de l'aviation civile

*80 ans au service de la sécurité aérienne*

# Activity report 2025

RÉPUBLIQUE FRANÇAISE

*Liberté*
*Égalité*
*Fraternité*


BÉA

# Contents

# A MESSAGE FROM THE DIRECTOR

The BEA will be celebrating its 80th anniversary in 2026. As I write these lines, more than 17,000 occurrences have been the subject of a safety investigation since 1946. BEA staff, past and present, can be proud of the work accomplished. Indeed, the BEA's technical and human expertise, along with its collective capacity for renewal and innovation, has made it a global benchmark. In 80 years, the world of civil aviation and the world at large have evolved considerably, but the BEA's mission, championed by its successive directors since Maurice Bellonte, remains the same: to improve civil aviation safety. The past year has been no exception.

At a global level, this year was marked by major accidents in commercial air transport in the United States and India. While no such accidents occurred in France, the BEA opened investigations into serious incidents that could have had catastrophic outcomes. The near-collision in Nice on 21 September 2025, which received extensive media coverage, illustrates, if any further proof were needed, that safety can never be taken for granted.

A large team of dedicated investigators are still working on this serious incident.

France recorded five commercial air transport accidents, resulting in a total of nine serious injuries: two in two balloon accidents and seven in two airliner accidents related to in-flight turbulence.

At an international level, the BEA, as is the case every year, appointed numerous accredited representatives to contribute to investigations. Two accidents where a BEA team was dispatched to the scene stand out: the fire on an Airbus A321 in South Korea, with no fatalities and the crash of a Dassault Falcon 50 in Turkey, which claimed eight lives, including two French citizens.

Regarding safety in general aviation in France, the picture is rather mixed. The number of accidents and victims across all activities is slightly higher, but remains below the average of the past decade. This increase is primarily due to aeroplane accidents, which are rising and exceed the decade's averages, while those for the microlight activity are relatively stable, or even falling.

2025 marked the implementation of a new BEA investigation policy. This new policy, which notably resulted in the discontinuation of desktop investigations (known as Category 3 investigations), allows the BEA to better allocate its resources to occurrences from which it hopes to draw the most valuable safety lessons, particularly the analysis of early warning signs. It reflects a commitment to publishing investigation reports more quickly and increasing the number of targeted and directly usable publications that accompany an investigation report.

This desire to better showcase the results of the investigations has also led to an evolution of the website, notably with a more user-friendly structure and easier tracking of issued recommendations.

2025 was also the year of two important events at the BEA: an ICAO audit and a peer review by the European Network of Civil Aviation Safety Investigation Authorities (ENCASIA).

While their official results have not yet been published, it is already clear that the BEA's organization and effectiveness will be highlighted, reinforcing its strategy of achieving technical independence and the continuous improvement of its methods.

I wish you all a pleasant read!

**Pierre-Yves Huerre,**
Director of the BEA

BEA 80


Accident to the Airbus A321 registered HL7763 operated by Air Busan on 28/01/2025 at Gimhae airport

01

# Overview of accidents

concerning the BEA in 2025, opening of investigations

BEA 80

1.1

# General context

The obligations of European Union member states with regard to civil aviation safety investigations are laid down in European regulation No 996/2010 of the European Parliament and of the Council on the investigation and prevention of accidents and incidents in civil aviation.

The general principle of this regulation stipulates that any civil aviation accident or serious incident must be the subject of a safety investigation in the Member State where it occurred: this obligation applies to all aircraft – whether manned or unmanned (drones) – with the exception of those listed in Annex I of Regulation (EU) No 2018/1139 (the aircraft listed in this annex include, microlights, amateur-built aircraft, historic aircraft, etc.).

However, there are some exceptions: *"the responsible safety investigation authority may decide, taking into account the expected lessons to be drawn for the improvement of aviation safety, not to initiate a safety investigation when an accident or serious incident concerns an unmanned aircraft for which a certificate or declaration is not required […], or concerns a manned aircraft with a maximum take-off mass less than or equal to 2,250 kg, and where no person has been fatally or seriously injured."*

Annex 13 to the Convention on International Civil Aviation (ICAO) also specifies that, when a safety investigation is conducted by a State (usually the State of Occurrence), the State of the Operator, the State of Registry and the State of Design and of Manufacture of the aircraft involved are invited to participate in this investigation, by appointing an accredited representative (ACCREP).


Accident to the Jodel D140 registered F-BMFV on 28/02/2025 on the Vallée Blanche glacier – report published in 2025

In France, the BEA is the authority responsible for safety investigations. Since the beginning of 2025, the guidelines of its investigation policy stipulate that, in addition to the investigations it has an obligation to conduct in accordance with European regulations, it will also investigate the following occurrences when its resources permit:

- accidents involving an aircraft with an ICAO certificate of airworthiness (CoA) or a special certificate of airworthiness when they result in fatal or serious injuries;
- fatal aircraft accidents when they involve production microlights (excluding paramotors) or DGAC-eligible kit-built aircraft (CNSK).

The default scope of this new investigation policy is more restricted than that of the previous policy followed between 2015 and 2024. The BEA wants to give itself more flexibility to open investigations into occurrences where there is no obligation to do so, but where the added value for improving safety could be significant. Examples include occurrences classified as incidents in commercial air transport under an AOC, or accidents involving uncertified aircraft that are not necessarily fatal, but which are of particular interest for safety. Criteria as to the relevance of opening an investigation include:

- the presumed benefits of an independent safety investigation, as opposed to an analysis by the organizations concerned;
- the nature and context of the flight, where it can be deduced that third parties on the ground or unsuspecting passengers were exposed (in particular, if the activity is for the benefit of third parties);
- the involvement of a widespread aircraft type (in particular certain aircraft with a restricted certificate of airworthiness);
- the expectations of the aviation community or civil society.

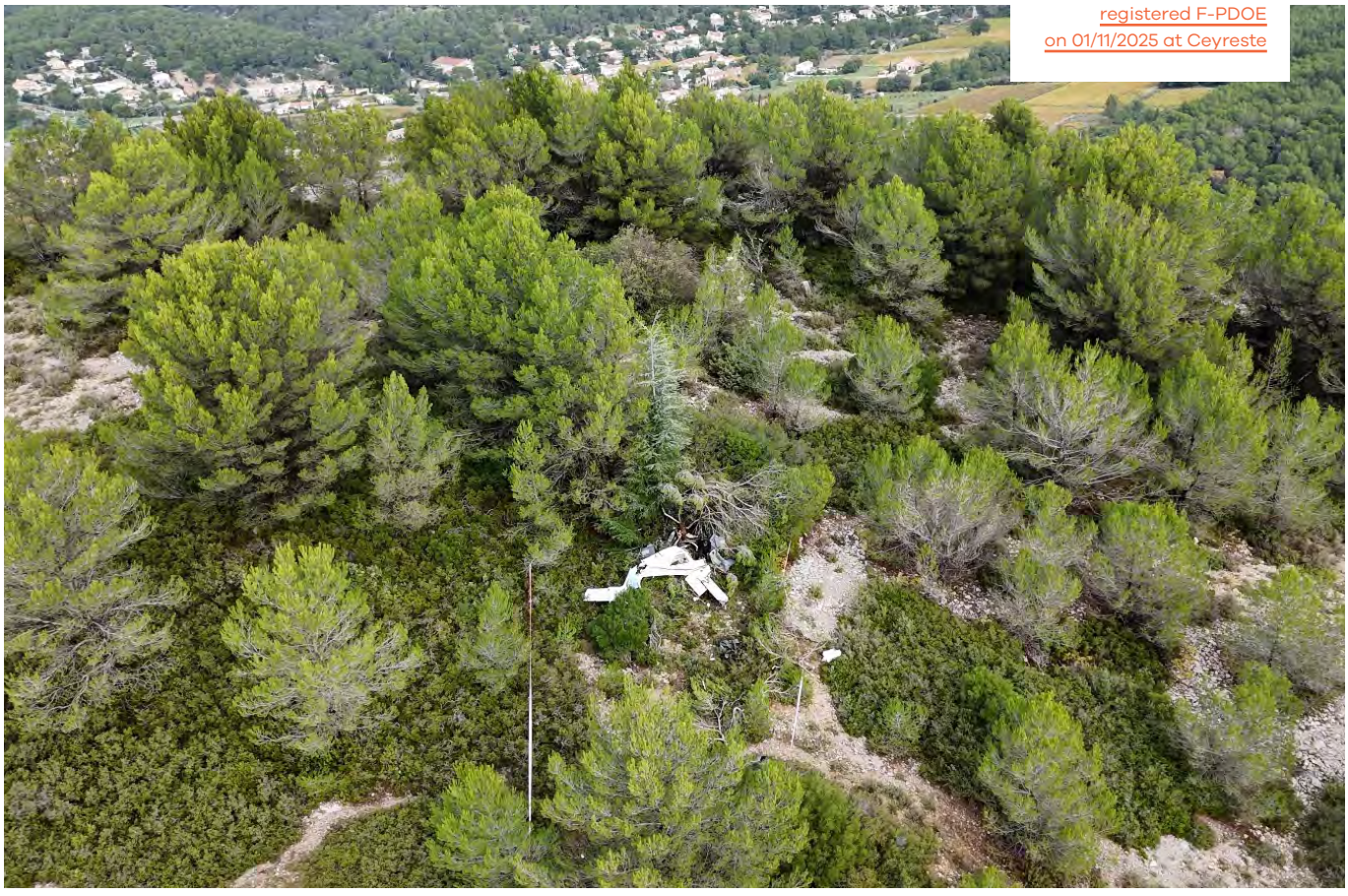
1.2

# Accident data and investigations opened

In 2025, the BEA processed just over 1,100 occurrences during the daily notification review; this figure is comparable to that of previous years.

## 1.2.1. Accidents in France in 2025

The number of accidents recorded in France in 2025 rose by 14% compared to 2024, while remaining slightly lower than in previous years. The number of fatal accidents rose by 61% compared to 2024 and the number of victims rose by 38%. However, these year-on-year variations should be interpreted with caution, as they are based on relatively small numbers.



Accident to the Dyn Aero MCR04S registered F-PDOE on 01/11/2025 at Ceyreste

# Accidents[1] in France in 2025

The data in the table below comes principally from two sources:

- investigations conducted by the BEA;
- information provided by field investigators with respect to accidents that are not the subject of a BEA investigation.

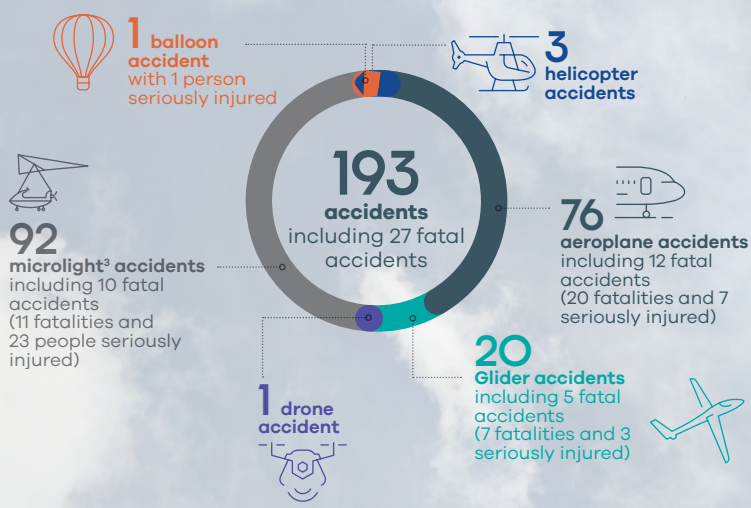
## COMMERCIAL TRANSPORT


## AERIAL WORK/ SPECIALIZED ACTIVITY[2]


**201**
accidents in 2025 including 29 fatal accidents

**41**
fatalities in 2025 and 43 people seriously injured

## GENERAL AVIATION




1. *The number of recorded accidents may differ from the number of aircraft involved, particularly because an accident can involve several aircraft.*
2. *The heading "aerial work/specialized activity" includes accidents occurring during aerial activities listed in GM1 SPO.GEN.005 associated with Regulation (EU) No 965/2012, even if the flights in question do not formally meet the requirements of PART SPO of this regulation.*
3. *Local revenue flights in a microlight are included in the "general aviation" category.*

## More information about accidents in France in 2025

**Commercial Air Transport**

Aeroplanes operated in the scope of commercial air transport:

- Accident to the Airbus A320 registered F-HBNJ operated by Air France on 20 August during the descent to Ajaccio: the aeroplane encountered severe turbulence close to a zone of convective activity. Three cabin crew members and two passengers were seriously injured.
- Accident to the Boeing 737 (MAX 8) registered EI-HGO operated by Ryanair on 28 December in climb to cruise level: the aeroplane very probably encountered wake vortices around 7 NM behind another Boeing 737. Two passengers were seriously injured.

Helicopters operated in the scope of commercial air transport:

- Accident to an Airbus AS350 on 25 October: the pilot quickly made inputs on the controls to return the helicopter to the ground when it rose in an uncontrolled manner. During the manoeuvre, the helicopter was damaged. In accordance with its investigation policy and with regulations, the BEA did not open an investigations into this accident.

Balloons operated in the scope of commercial air transport:

- Accident to the Lindstrand LTL Series 1 registered F-HCMP operated by JLJBALLOON on 4 March at Castelnaud-la-Chapelle: the pilot was intentionally flying at a low height while interacting with his passengers; he detected the terrain on the flight path too late and despite attempting to gain altitude, the enveloppe came into contact with the vegetation. The pilot was injured during an evacuation.
- Accident to the Cameron Z210 registered F-HRGC operated by Montgolfières du Périgord on 30 May at Saint-Cyprien: a passenger suffered a serious injury to her right ankle during the landing bounces.

For the first time in several years, the BEA was not informed of any accidents concerning microlights operated in the scope of commercial air transport. However, the BEA is not always able to detect the commercial context of a microlight flight based on the preliminary information it receives after an accident. In the absence of an investigation, the information may remain unknown to the BEA.

There was one occurrence on 14 June during a commercial sightseeing flight with a DTA Xeeleex (gyroplane). According to the pilot, the passenger unfastened his seatbelt and jumped while the microlight was flying over the sea; this passenger died. The BEA did not classify the occurrence as an accident and therefore did not open an investigation.

**Specialized activity/aerial work**

Aircraft operated in the scope of a specialized activity or aerial work

- Accident to the tug plane, the Robin DR400 registered F-HRPB and the towed glider, the Schleicher ASW20 registered D-2020 on 16 August at Saint-Pons: collision with the ground when the combination was in initial climb: the pilots alone on board their respective aircraft were fatally injured.
- Accident to the Morane Saulnier MS733 registered F-AZXU on 6 June on Rochefort – Charente-Maritime aerodrome: collision with the ground during an airshow, fatally injuring the pilot.
- Accident to a Cessna 207: runway overrun at the end of a parachute drop flight. In accordance with its investigation policy and with regulations, the BEA did not open an investigation into this accident.

### 1.2.2 Investigations opened by the BEA in 2025

In 2025, the BEA opened **68 investigations**. This number, notably lower than in previous years, should be interpreted in light of the new investigation policy:

- Approximately forty "material-damage" accidents involving certified aircraft with a maximum take-off mass of less than 2,250 kg were not investigated by the BEA, in accordance with the derogation provided for in Article 5 of Regulation (EU) No 996/2010. Under the BEA's investigation policy until 2024, accidents in this category were generally the subject of a desktop investigation.
- Eight fatal accidents involving aircraft covered by Annex 1 to Regulation (EU) No 2018/1139 were not investigated. The BEA notably excluded accidents involving aircraft which are not widely flown or accidents where initial information suggested that little relevant data could be collected and analyzed. Under the BEA's investigation policy until 2024, accidents of this type were systematically investigated whenever its resources allowed.

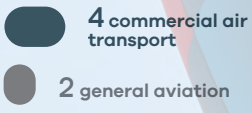
As anticipated when the new investigation policy was defined, the resources thus freed up enabled the BEA to open investigations into six incidents, four of which involved large-capacity aeroplanes operated in commercial air transport. These investigations are generally time-consuming. They are in addition to the six investigations into serious incidents in commercial air transport.

**Investigations opened according to type of operation**

**51**
**accidents**
compared to 80 in 2024


**11**
**serious incidents**
compared to 10 in 2024


**6**
**Incidents**
compared to 5 in 2024




### Investigations opened according to aircraft categories

The BEA opened eleven investigations into safety occurrences involving aeroplanes of a mass of more than 5,700 kg (compared to eight in 2024). In addition to the two accidents mentioned in paragraph 1.2.1 (as a result of turbulence), there were four serious incidents and five incidents (see below).




| | Fixed-wing aircraft | | Rotary-wing aircraft | | Drones | Others | Total |
|---|---|---|---|---|---|---|---|
| | **< 5,700 kg** *Light aeroplanes, gliders and fixed-wing microlights* | **≥ 5,700 kg** *Large capacity aeroplanes* | **< 3,175 kg** *Light and Ultralight helicopters gyroplanes* | **≥ 3,175 kg** *Large capacity helicopters* | | *Balloons, paramotors and flex-wing microlights* | |
| Accidents | 45 | 2 | 2 | 0 | 0 | 2 | **51** |
| Serious incidents | 7 | 4 | 0 | 0 | 0 | 0 | **11** |
| Incidents | 1 | 5 | 0 | 0 | 0 | 0 | **6** |
| **Total** | **53** | **11** | **2** | **0** | **0** | **2** | **68** |

## More information about coordination with the BEA-É

The BEA regularly coordinates with the BEA-É (the State Aviation Accident Investigation Authority). This coordination covers in particular:

- occurrences likely to concern both authorities;
- occurrences where one authority has to provide technical assistance to the other;
- cross-training actions.


Accident to the Sonaca S200 registered F-HGRA on 05/10/2024 at Espira-de-l'Agly – report published in 2025

As an example, in 2025, the BEA appointed an ACCREP to the BEA-É in charge of the investigation into the collision between an AS350 helicopter operated by the French National Gendarmerie and a civilian drone operated by a private owner. For its part, the BEA-É appointed an ACCREP to the BEA for the investigation into the accident to F-AZKU (see paragraph 1.2.1)

## More information about investigations into incidents and serious incidents

The BEA opened 17 investigations into incidents and serious incidents in 2025.

### Serious incidents in commercial air transport

The following investigations were opened into serious incidents in the field of commercial air transport:

- Serious incident to the De Havilland DHC-6 registered PJ-WIX operated by Winair and the Pilatus PC12 registered N590TW operated by Tradewind Aviation on 29 January at Saint-Barthélemy: landing on an engaged runway.
- Serious incident to the Cessna 525 registered F-HJAV operated by Valljet on 14 March near Le Bourget: deviation from flight path following an undetected anomaly on the air data system. A TAWS warning was activated during the approach to Paris - Le Bourget airport. The BEA has published a preliminary report.
- Serious incident to the Airbus A321 registered PH-YHC operated by Transavia on 29 April en route: loss of radar contact followed by a loss of separation with another commercial air transport aeroplane. The BEA has published a joint interim report concerning this occurrence and two others, namely:
  - incident to the Airbus A321 registered PH-YHA operated by Transavia on 13 January en route: radar and radio failure en route;
  - serious incident to the Airbus A320 registered EI-NSF operated by Aer Lingus

Accident to the Aerospool WT9 identified 04FO on 11/08/2024 at Eschbach - report published in 2025

on 20 September 2024 en route: radio and transponder failure.

- Serious incident to the Airbus A320 registered CN-NMI operated by Air Arabia Maroc and to the Diamond DA42 registered F-GVKM on 15 September at Montpellier: loss of separation between the A320 and the DA42 holding, during a missed approach carried out by the Airbus.
- Serious incident to the Airbus A320 registered TS-INP operated by Nouvelair and the A320 registered OE-IJZ operated by easyJet Europe on 21 September at Nice: approach at night on a runway engaged by another commercial air transport aeroplane lined up ready for take-off, flight over the latter followed by a go-around. The BEA has published a preliminary report.
- Serious incident to the ATR 72 registered F-ORVO operated by Air Tahiti on 29 September at Nuku Hiva: jamming and then uncoupling of the elevator control during approach.

**Serious incidents in general aviation and aerial work**

The following investigations were opened into serious incidents in the field of general aviation or aerial work:

- Serious incident to the Pilatus PC6 registered HB-FDU on 23 March at Maripasoula: loss of control on short final, collision with ground.
- Serious incident to the Robin DR400 registered F-GGJG on 28 March at Lognes – Emérainville: runway veer-off followed by a balked landing during a solo instruction flight. During the manoeuvre, the aeroplane flew over the taxiways and ramp at a low height.
- Serious incident to the Pilatus PC6 registered F-GJBC and the Stampe SV4-RS identified 59EDB on 17 May at La Baule – Escoublac: at the end of a parachute drop, the pilot of the Pilatus landed at the same time as the pilot of the microlight which was finishing a commercial sightseeing flight.
- Serious incident to the Cessna 172 registered F-HJAK and two Rafale on 18 September at Figari – Sud-Corse: loss of separation between the Cessna and the two fighter jets.
- Serious incident to the Rolladen Schneider LS6 registered F-CGUH on 18 November at Mons: collision with tree tops while looking for uplifts.

Accident to the G1 AVIATION identified 04IF on 04/02/2023 at Salignac - report published in 2025

**Incidents classified as non-serious, for which the BEA opened an investigation**

The BEA opened six investigations into incidents classified as non-serious. Four concerned aircraft operated in the scope of commercial air transport. One concerned a commercial air transport aeroplane during a ferry flight and the sixth one concerned a twin engine used for instruction.

Beside PH-YHA, the following investigations were opened into incidents classified as non-serious:

- Incident to the Dassault Falcon 8X registered F-GLLM on 11 January near Paris – Le Bourget airport: the aeroplane deviated from the missed approach path.
- Incident to the Tecnam P2006T registered F-HBDE on 23 April near Nîmes – Garons airport: during an exercise in a dual control instruction flight, the left-hand engine ceased operating. The instructor took the controls but was unable to feather the propeller. Observing that he was unable to hold level flight and reach Nimes airport, he carried out a forced landing in a field.
- Incident to the Airbus A321 registered F-GMZC operated by Air France on 27 April near Paris – Charles de Gaulle airport: blocking of trimmable horizontal stabilizer during descent.
- Incident to the Beech 1900 registered F-GLNE and the Bell 429 registered F-HPBH on 27 May at Aix-les-Milles: wake vortices on final approach behind a helicopter, during a ferry flight followed by a missed approach.
- Incident to the Airbus A319 registered EC-MTD operated by Volotea on 4 December near Paris – Orly airport: control cleared the crew to carry out an ILS approach although the ILS signal was not activated. During the descent, a MSWA alert was activated and the crew carried out a missed approach.

## More information about different categories of investigation carried out by the BEA

The BEA adapts its investment in investigations and the type of report it produces according to the perceived level of risk, the expected safety lessons and the target public. From 2025, the BEA stopped opening category 3 (desktop) investigations and now has only two investigation categories based on the criteria given below.

The following illustration shows the breakdown of investigations opened in 2025 by the BEA according to the investigation categories.

**Breakdown of the number of investigations opened in 2025, by category**




## Classification criteria

**for investigations carried out by the BEA**

> **Category 1 investigation:** an investigation which involves several areas of organizational and/or systemic analysis and which leads to the writing of a report based on the complete structure proposed by ICAO Annex 13. Category 1 investigations generally lead to safety recommendations being issued. They are "major" investigations into accidents involving an aircraft operated under an air operator's certificate with a maximum certified take-off mass of more than:


> **Category 2 investigation:** this category is for investigations where the areas of in-depth examination and analysis are limited, giving rise to a "simplified" report. The structure of these reports may deviate from the ICAO Annex 13 model to suit the circumstances of the event and the issues involved in the investigation. These investigations are applicable to all types of operation. Their primary aim is to provide operational feedback, but they can also lead to safety recommendations being issued.

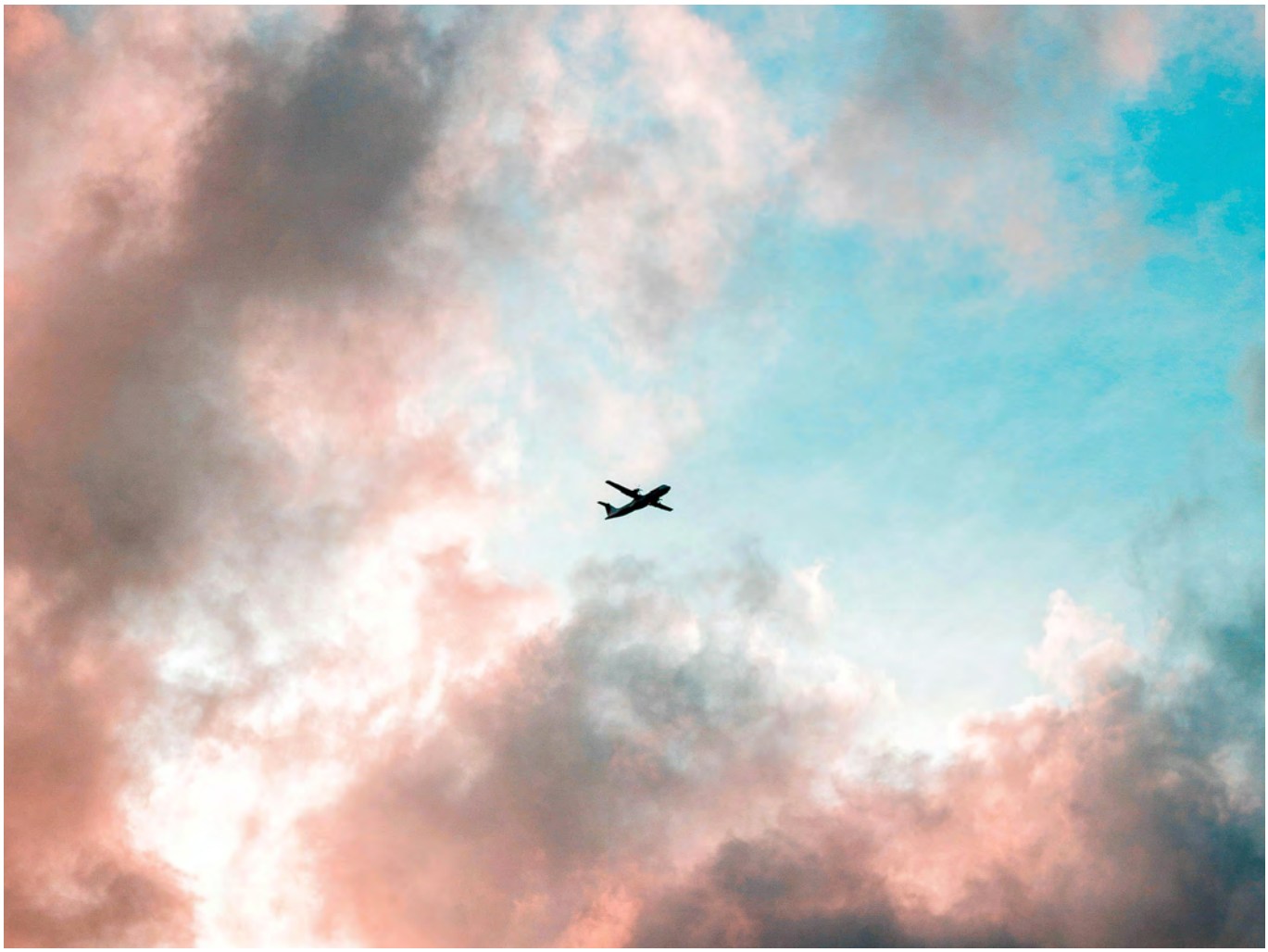
## 1.2.3 Investigations opened by a foreign investigation authority and officially notified to the BEA

**Foreign investigations opened in 2025 about which the BEA received an official notification**

| | Commercial air transport | General aviation | Aerial work | State aircraft | Other or undeter-mined | Total | *Total in 2024* |
|---|---|---|---|---|---|---|---|
| Accidents | 35 | 40 | 14 | 5 | 20 | **114** | *117* |
| Serious incidents | 81 | 9 | 6 | 3 | 5 | **104** | *103* |
| Incidents | 37 | 1 | 0 | 1 | 1 | **40** | *29* |
| **Total** | **153** | **50** | **20** | **9** | **26** | **258** | *249* |
| *Total in 2024* | *161* | *47* | *13* | *10* | *18* | *249* | |

The number of occurrences where a foreign authority opened an investigation and notified this to the BEA in compliance with the criteria of ICAO Annex 13 is in 2025, close to the number in 2024 (increase of 4%).

As a consequence of the success of the French industry, accredited representation plays a major role in the BEA's activities and operations. For several years now, the BEA has adapted the allocation of its resources to foreign investigations based on the reason for the proposed accredited representation and the related stakes. The classification criteria for foreign investigations for which the BEA appoints an ACCREP are described on the following page.



# Classification criteria

**for investigations carried out by a foreign authority and notified to the BEA**

**> Category 1**
**accredited representation**

- These concern accidents or incidents involving aeroplanes with a maximum take-off mass of more than 5,7 t, where:
  - at least one person on board was fatally injured (except natural injuries) or
  - there was an emergency evacuation and the aircraft was destroyed or the aircraft is reported missing,
- Or accidents or incidents involving helicopters of more than 3.18 t where:
  - at least one person on board was fatally injured (except natural injuries), or
  - there was an emergency evacuation and the aircraft was destroyed or the aircraft is reported missing.

**> Category 3**
**accredited representation**

- These concern accidents or incidents involving aeroplanes of French design of less than 2.25 t:
  - where, a priori, the BEA will not be an added value during the investigation, or
  - there is no obvious link to the reason for the accreditation, or
  - where there is no particular request from the authority in charge, or
  - which would not be the subject of a BEA investigation, or
  - which are listed in Annex I.
- Or accidents or incidents involving aeroplanes of French design of more than 2,25 t:
  - where, a priori, the BEA will not be an added value during the investigation, or
  - there is no obvious link to the reason for the accreditation, or
  - where, a priori, there are no benefits or stakes for the manufacturer and/or the BEA, or
  - which would not give rise to the opening of a BEA investigation in France, or
  - where there is no particular request from the authority in charge, or
  - where there is no justified request from the manufacturer.
- Or helicopter accidents and incidents:
  - with no casualties, or
  - where there is no particular request from the authority in charge, or
  - there is no obvious link to the reason for the accreditation, or
  - where there is no justified request from the manufacturer.
- Or accidents and incidents involving aircraft equipped with engines of French design or manufacture:
  - if no component manufactured by the French manufacturer appears to have contributed to the occurrence, or
  - there is no obvious link to the reason for the accreditation, or
  - where there is no justified request from the engine manufacturer.

**> Category 2**
**accredited representations**

- Concern aircraft accidents and incidents that do not meet the criteria for ACCREP categories 1 and 3.

ACCREP participation is:

> active for category 1 ACCREP (major event);
> active, depending on the needs of the foreign authority, for category 2 ACCREP;
> on standby, awaiting a possible request from the foreign authority, for category 3 ACCREP: this category mainly concerns occurrences involving French-designed aircraft where no safety issues directly linked to the design characteristics are a priori identified.

The illustration opposite shows the breakdown of the BEA's accredited representations in 2025 according to the level of involvement (ACCREP categories).

**BEA foreign investigations by category:**

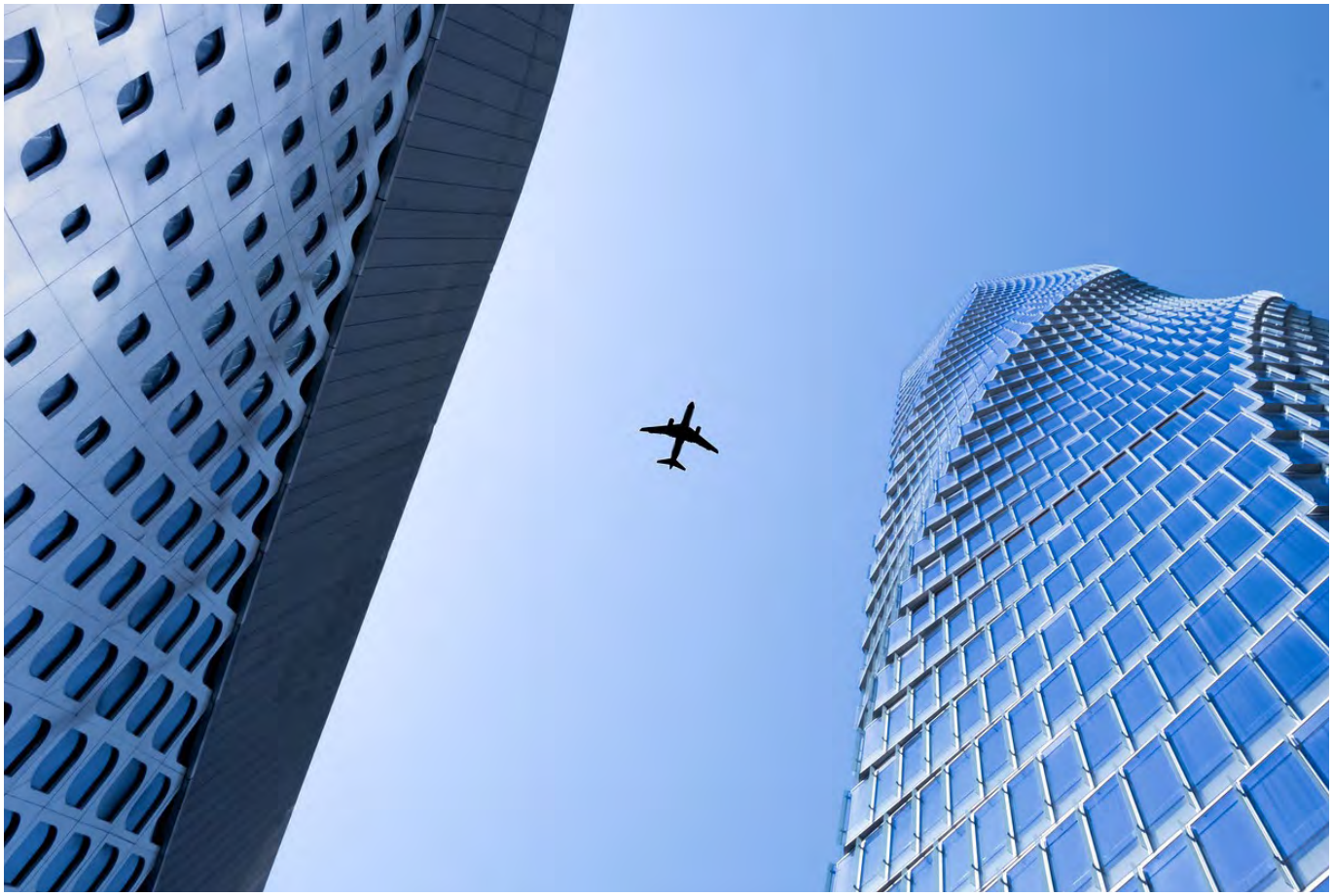
In 2025, the BEA classified three ACCREP as category 1:

- The accident to the Airbus A321 registered HL7763 operated by Air Busan on 28 January at Gimhae (South Korea): a fire broke out in the cabin while the aeroplane was still at its gate waiting for the push-back prior to departing. The crew ordered an emergency evacuation. The aeroplane was destroyed by fire. Four BEA investigators travelled to the site accompanied by Airbus technical advisers.

- Accident to the Boeing 787 registered VT-ANB operated by Air India on 12 June at Ahmedabad (India): collision with buildings just after take-off killing 241 of the 242 people on board the aeroplane and 19 people on the ground. The Indian investigation authority sent a notification to the BEA in the weeks following the accident. However, at the time of writing this report, the BEA had still not received a formal contribution request in the scope of this investigation.

- Accident to the Dassault Falcon 50 registered 9H-DFS operated by Harmony Jets on 23 December at Kessikavak (Ankara, Turkey): collision with the ground killing the eight people on board the aeroplane including the two French pilots. The BEA sent a team of three investigators to the site accompanied by technical advisers from Dassault (manufacturer) and Harmony-Jets (operator).

The cases per ACCREP category can change depending on the requests from foreign safety investigation authorities.



### 1.2.4 Go-teams

In the case of a particularly serious occurrence (in France or abroad), the BEA sends a team of investigators to the site within hours of receiving the notification. The size and composition of this Go-Team are defined on a case-by-case basis.


28
**Go-Teams**
deployed in 2025

**Breakdown of Go-Teams dispatched in 2025:**

- **25 in Metropolitan France**
- **1 in Spain** following the incident to the Airbus A321 registered EC-OOJ operated by Iberia on 3 August 2025 at Madrid. After taking off, the aeroplane struck a large bird which damaged the radome. Debris was ingested by the left-hand engine causing it to shut down and the appearance of smoke in the aeroplane.
- **1 in Turkey** (see paragraph 1.2.3)
- **1 in South Korea** (see paragraph 1.2.3)


Accident to the Airbus A321 registered HL7763 operated by Air Busan on 28/01/2025 at Gimhae airport (South Korea)

## 1.2.5 Field investigators

The BEA uses the services of field investigators who are staff in the French civil aviation authority (DGAC), mostly posted in the different inter-regional divisions, or in the delegations and overseas services of the French civil aviation safety directorate (DSAC). Some field investigators also come from the French air navigation service provider (DSNA)

These investigators are trained by the BEA and are approved by the BEA director in accordance with the provisions of the Code of Transport.

They intervene at the request of the BEA, and under its authority, to carry out the initial investigative acts (often on-site), immediately after the accident, exclusively within French national territory. They are primarily deployed to general aviation occurrences, but they sometimes also intervene in commercial air transport occurrences, particularly in the overseas territories.

As required, BEA investigators join them, or not, on site. In all cases, the rest of the investigation is carried out by BEA investigators.

The total number of field investigators as of 31 December was 129.

Maintaining the number and skills of the field investigators is a major priority for the BEA to ensure rapid and effective intervention throughout the country, year-round.

Approximately thirty field investigator deployments were recorded.

02

# Investigations closed

reports published in 2025

2.1

# Investigations closed, investigation reports and studies published

European regulation No 996/2010 specifies that each safety investigation must be concluded with a report in a format that is adapted to the type of occurrence. The BEA now uses two types of report. Category 1 investigations generally give rise to ICAO format reports while category 2 investigations are the subject of simplified reports or ICAO format reports. In 2025, the last simplified reports concerning category 3 investigations opened in 2024 were published.

71
**final reports**
published

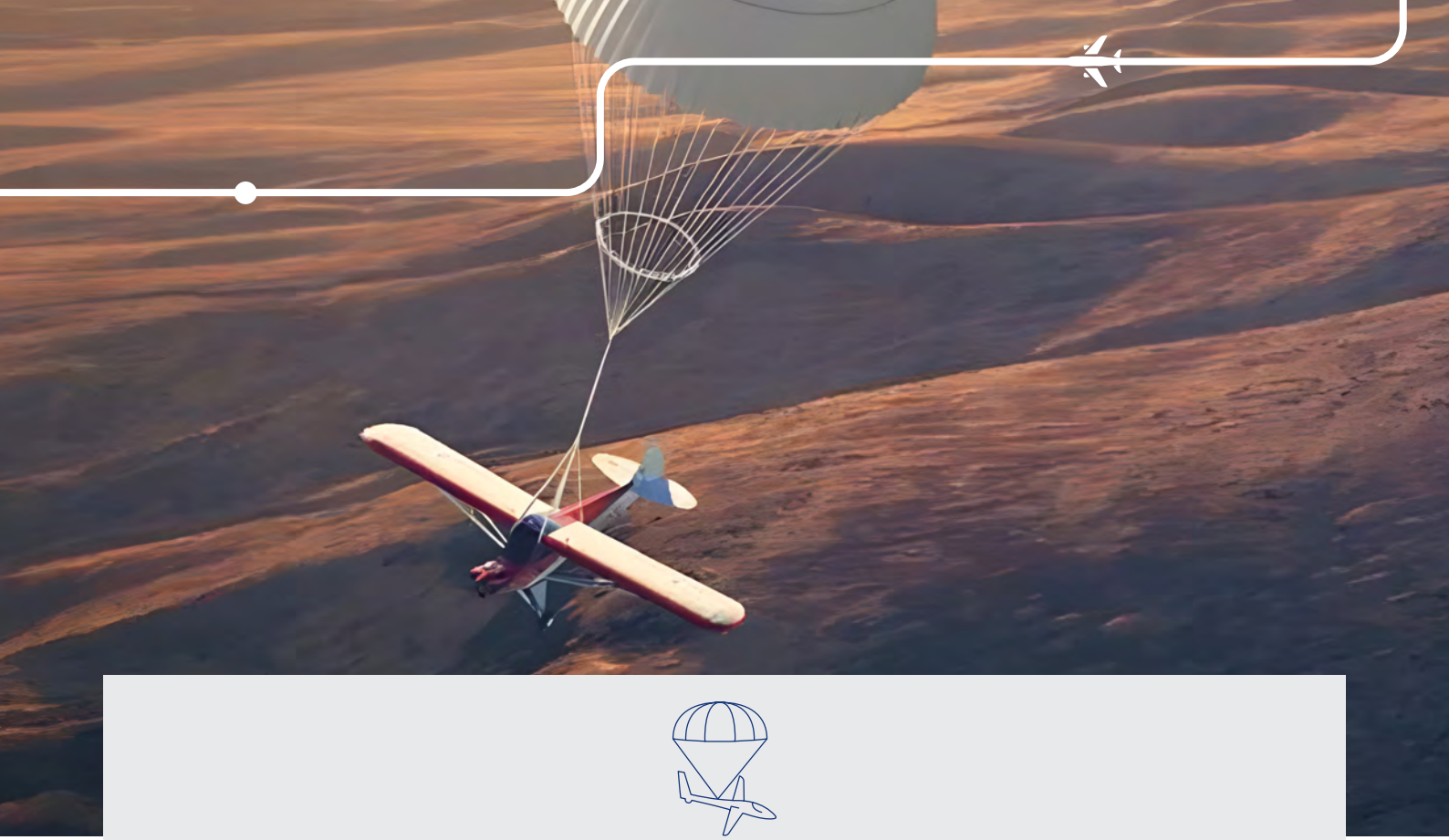
**Number of reports published by the BEA in 2025 according to investigation category**

| | Category 1 | Category 2 | Category 3 | Total |
|---|---|---|---|---|
| Commercial air transport | 1 | 10 | 0 | **11** |
| *including reports with safety recommendations* | *0* | *2* | *0* | *2* |
| Aerial work/specialized activity | 0 | 10 | 0 | **10** |
| *including reports with safety recommendations* | *0* | *1* | *0* | *1* |
| General aviation | 0 | 45 | 5 | **50** |
| *including reports with safety recommendations* | *0* | *2* | *0* | *2* |
| **Total** | **1** | **65** | **5** | **71** |
| *including reports with safety recommendations* | *0* | *5* | *0* | *5* |

**Breakdown by report format**

In 2025, the BEA also published two preliminary reports (concerning the serious incidents to F-HJAV and TS-INP) and a joint intermediate report concerning two serious incidents and one incident (respectively to EI-NSF, PH-YHA and PH-YHC) as mentioned in paragraph 1.2.2.


4. *Two category 2 investigations were the subject of ICAO format reports, EC-NGC & F-HYTO.*



## Study concerning the activation of a ballistic airframe parachute: cognitive, emotional and physical mechanisms

The BEA published a study analysing the factors which influence the activation, or not, of the ballistic airframe parachute installed on certain light aircraft, principally microlights.

It covers 95 accidents that occurred between January 2015 and August 2022: 88 of these involved microlights, including 38 which were fatal.

Four main situations leading to the activation of the parachute were identified:

- loss of control;
- loss of visual references;
- excessive speed;
- and no suitable landing area.

The study highlights the benefit of the ballistic airframe parachute, when deployed within its field of use, in mitigating bodily injuries arising from the fall of the microlight.

The analysis of the occurrences and the associated statements brought to light key factors that contribute to the parachute being activated

- the pilot's assimilation of the parachute through knowledge;
- having already performed the action;
- knowing real-life stories where the parachute was activated.

If the pilot has identified the situations where it can be deployed, it will allow him/her to better assess their resources, increase their ability to cope and reduce their stress.

Not wanting to think about it, or dismissing its use, which may be a symptom of an ego-defensive bias (in the form of denial), may (unconsciously) serve to reduce the pilot's anxiety and reassure them in the short term, but is counterproductive in an accident situation.

2.2

# More information about the BEA's production and performance

## 2.2.1 General

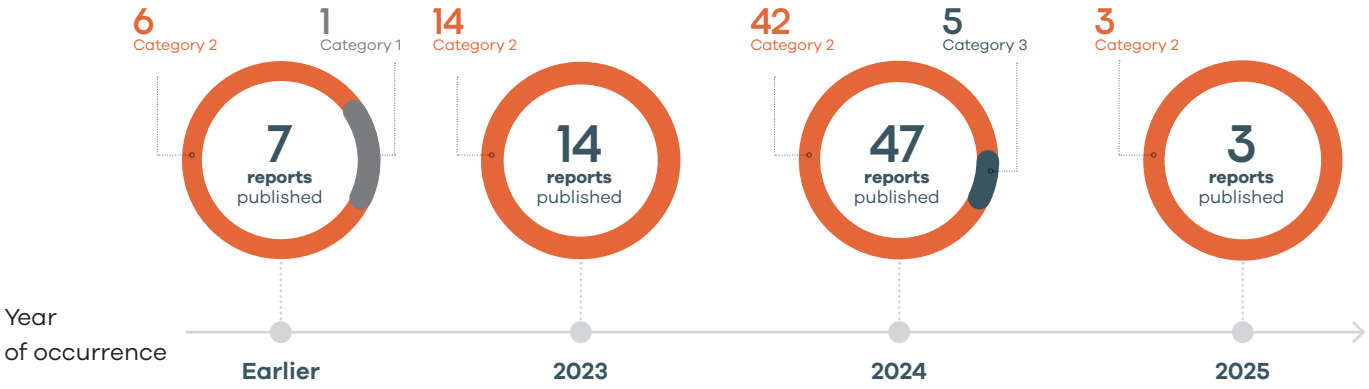
The BEA published 71 final reports in 2025, compared to 119 in 2024 and 144 in 2023. This substantial decrease is due to several factors, including:

- the discontinuation of category 3 investigations at the end of 2024;
- the downward trend in the number of investigations opened in recent years, both for occurrences covered by the BEA's old and new investigation policies. This trend is itself statistically linked to the decrease in the number of accidents recorded between 2022 and 2024;
- the effort to reduce the duration of investigations and accelerate the publication of reports in recent years: a significant number of reports were published in 2023 and 2024, leading to a large reduction and then a stabilization in the number of open investigations.

It is also worth noting that the BEA published three preliminary reports in 2025. The preparation of these reports generates a high workload for the BEA investigators and their technical advisers, all within tight deadlines. Their objective is to quickly provide the aviation community with initial technical information that will enable, where necessary, the implementation of safety measures, a better operational understanding of the event, or an early comprehension of its circumstances.

## 2.2.2. More information about the age of the investigations closed and the stock of investigations

The following table indicates, for each category, the age of the investigations that were closed in 2025.




The stock of open investigations as of 31 December 2025 was 88. This number is very slightly down on the previous year (91). Among these investigations, 23 have been open for more than one year (compared to 26 in 2024 and 37 in 2023). The age of the stock is indicated by investigation category in the table below.

**Age of "open" BEA investigations as of 31 December 2025**

| | Category 1 | Category 2 | Total |
|---|---|---|---|
| Less than one year | 0 | 65 | 65 |
| One to two years | 0 | 18 | 18 |
| More than two years | 0 | 5 | 5 |
| **Total** | **0** | **88** | **88** |

The aim of the BEA is that no category 2 investigation shall exceed a duration of two years. On 31 December 2025, there were five category 2 investigations which were more than two years old: four investigations which were in the formal consultation phase with respect to the draft report and one investigation where the final report was being finalized at the end of 2025.


Accident to the Jodel DR1050 registered F-BJOZ on 05/07/2025 near Châteauroux-Villers AD

### 2.2.3 More information about the performance indicator "investigations closed in less than one year"

Regulation (EU) No 996/2010 specifies that an investigation report should be published rapidly and if possible within the twelve months following the date of the occurrence. In addition to the expectations that the community may have after a safety occurrence, closing investigations within these timeframes helps to control the stock of ongoing investigations in light of an accident history marked by strong seasonal fluctuations. For the BEA, this duration of 12 months is a general objective and a monitoring indicator. This is defined as the percentage of investigations closed within one year among the investigations opened the previous year.

In 2025, the overall result of this indicator was 60%. It was 73% in 2024.

If a distinction is made between investigation categories (as defined in paragraph 1.2.2), the indicator gives very different values as shown in the table below.

**Breakdown of 2025 indicator concerning investigations closed in less than one year**

| | Category 1 | Category 2 | Category 3 | Overall |
|---|---|---|---|---|
| Investigations opened in 2024 | 0 | 70 | 25 | 95 |
| Closed in less than one year | - | 32 | 25 | 57 |
| **2025 indicator** | **-** | **46%** | **100%** | **60%** |

In 2025, the BEA set itself the target of closing 80% of its investigations in less than one year. More precisely, this target was broken down as follows:

- 100% of category 3 investigation reports should be published in less than one year;
- 70% of category 2 investigation reports should be published in less than one year.

As category 3 investigations have stopped, the associated sub-indicator will be removed and the BEA will adjust its future performance target to move towards that of the sub-indicator for category 2 investigations.

In general, the BEA's output in any given year is largely dependent on the number of recently opened investigations into occurrences involving aeroplanes operated for commercial air transport: recent years have seen a significant number of such investigations being opened.

One of the main objectives set out in the BEA's new investigation policy is to redeploy its resources to investigations expected to yield greater safety benefits. However, such investigations require a significant and sustained commitment of resources across various departments, particularly due to:

- the volume of factual information to be gathered;
- the large number of areas of analysis and the depth of these analyses;
- the translation of documents prior to consultation;
- the procedures for developing and validating potential safety recommendations;
- and, more generally, the procedures for reviewing and validating the final report.

Thus, in several respects, the evolution of the investigation policy has already had a negative impact on the performance indicator result in 2025 and will continue to do so in 2026: firstly, because a significant subset of reports with a near 100% guarantee of completion in a year will no longer be included in the result and secondly, because it encourages the opening of more time-consuming category 2 investigations (especially those involving large-capacity aircraft and/or aircraft operated for commercial air transport).

Furthermore, the BEA's participation in foreign investigations as the State of Design, Manufacture or Operator also impacts its activity. In 2025, the following investigations particularly mobilized BEA investigators:

- accident to the Airbus A321 registered HL7763 in South Korea;
- accident to the Dassault Falcon 50 registered 9H-DFS in Turkey;
- incident to the Airbus A320 registered N605JB en route in the United States.

The BEA has observed that for all investigations, the period between the start of internal peer reviews and the publication of the final report in its French version—a period that includes official consultation and validation—is difficult to reduce to less than four months and even longer for investigations into occurrences involving commercial transport aircraft. While improving the effectiveness of the processes is a concern for the BEA, the priority remains the quality of the final report. The time required to prepare the final report is assumed, even if it may affect the target publication time of less than twelve months.

Finally, even though the BEA is organizing itself accordingly to achieve the aforementioned objectives, its output remains subject to the possibility of a major occurrence in France or a series of large-scale occurrences abroad, requiring the BEA to appoint an ACCREP to lead a team of investigators. Faced with this possibility, the BEA has launched a process to develop a continuity plan aimed at anticipating the need for a temporary adjustment of its activities and operations.

# 0,3

# General considerations

on safety in France in 2025

BEA

3.1

# Commercial air transport

## 3.1.1 Safety Promotion

In early 2025, the BEA held a day of discussions with flight safety managers from major French operators and those with bases in France. Approximately sixty people representing twenty-two operators attended the event at the BEA.

This day provided an opportunity to present the safety promotion materials available on the BEA's website, in particular:

- thematic pages, regularly updated with the results of completed investigations;
- summary sheets called "Safety Digests" and, sometimes videos, associated with certain reports.

The objective of this material is to provide the aircraft operator staff concerned, with concise content that can be immediately used in their training material or for promoting safety within their organization. At the same time, these safety promotion resources may encourage the reading of the final reports, which are not necessarily read spontaneously. Feedback indicates that these resources are used and appreciated.

## 3.1.2 Aeroplane commercial air transport accidents

The two accidents involving large commercial air transport aeroplanes in France in 2025 were caused by turbulence:

- turbulence near a zone of convective activity for the Airbus A320 registered F-HBNJ;
- wake vortices en route for the Boeing 737 registered EI-HGO.

In both cases, passengers or cabin crew members suffered serious injuries. These accidents serve as a reminder that, according to data published by ICAO in its 2025 safety report, turbulence is by far the cause of the most number of accidents in scheduled commercial air transport involving aeroplanes over 5.7 t. In 2024, ICAO recorded 32 turbulence-related accidents. These accidents accounted for three-quarters of the serious injuries.

No accidents involving a French operator were reported abroad.

## 3.1.3 Aeroplane commercial air transport incidents and serious incidents

High-energy runway collisions are a major risk that has been identified by the aviation community for several decades now. In recent years, collisions in Lima (Peru), between an Airbus A320 taking off and an aircraft rescue and fire fighting vehicle and then in Tokyo (Japan) between an Airbus A350 landing and a De Havilland DHC-8 lined up for take-off, have led international civil aviation stakeholders to reassess the level of control of this risk.

For its part, the BEA conducted an important investigation that confirmed a residual weakness with respect to this major risk. This investigation concerned the serious incident on 21 September 2025, at Nice, during which an Airbus A320, after its crew mistakenly carried out an approach to the parallel runway, flew at very low height over another Airbus A320 lined up for take-off, without realizing it.

The risk of runway collisions was also illustrated on 29 January 2025, in Saint Barthélemy: the crew of a De Havilland DHC-6 landed on the runway where the crew of a Pilatus PC-12, which had just landed, was backtracking. This serious incident primarily illustrates the specific operating conditions at this aerodrome (environmental characteristics, high traffic volume, lack of regulation, lack of air traffic control, etc.). Other investigations are underway, in which the specific context of the Saint Barthélemy airport will continue to be explored.

Air traffic control is a cornerstone of commercial aviation safety. Its

operation has been observed and analysed in numerous investigations. As with all other operational and technical aspects, the amount of information collected in this area and the depth of the associated analysis are determined by the BEA based on the lessons that can be learned from each case. Several investigations opened in 2025 include an "air traffic control" component. In addition to the serious incident on 21 September at Nice mentioned above, there are:

- Serious incident to the Airbus A320 registered CN-NMI operated by Air Arabia Maroc and the Diamond DA42 registered F-GVKM on 15 September at Montpellier: loss of separation between the A320 and the DA42 during a missed approach carried out by the Airbus.
- Serious incident to the Airbus A321 registered PH-YHC operated by Transavia on 29 April en route: loss of radar contact followed by a loss of separation with another commercial air transport aeroplane (see paragraph 1.2.2).
- Incident to the Airbus A319 registered EC-MTD operated by Volotea on 4 December near Paris – Orly airport: control cleared the crew to carry out an ILS approach although the ILS signal was not activated. During the descent, a MSWA alert was activated and the crew carried out a missed approach.
- Serious incident to the Cessna 525 registered F-HJAV operated by Valljet on 14 March near Le Bourget: deviation from flight path following an undetected anomaly on the air data system. A TAWS warning was activated during the approach to Paris - Le Bourget airport.

# 3.2 General aviation

## 3.2.1 Overview of fatal accidents in general aviation, all types of aircraft category

The year 2024 was marked by a significant decrease in the number of fatal accidents and injuries in general aviation, across all aircraft categories.

Thus, the number of fatal accidents recorded in 2025 (27) is higher than the previous year (17), although it does not reach the average number of the last ten years (31). Similarly, while there has been a sharp increase in the number of injuries in 2025 (38) compared to the previous year (29), it remains well below the average for the period 2016–2025 (47).

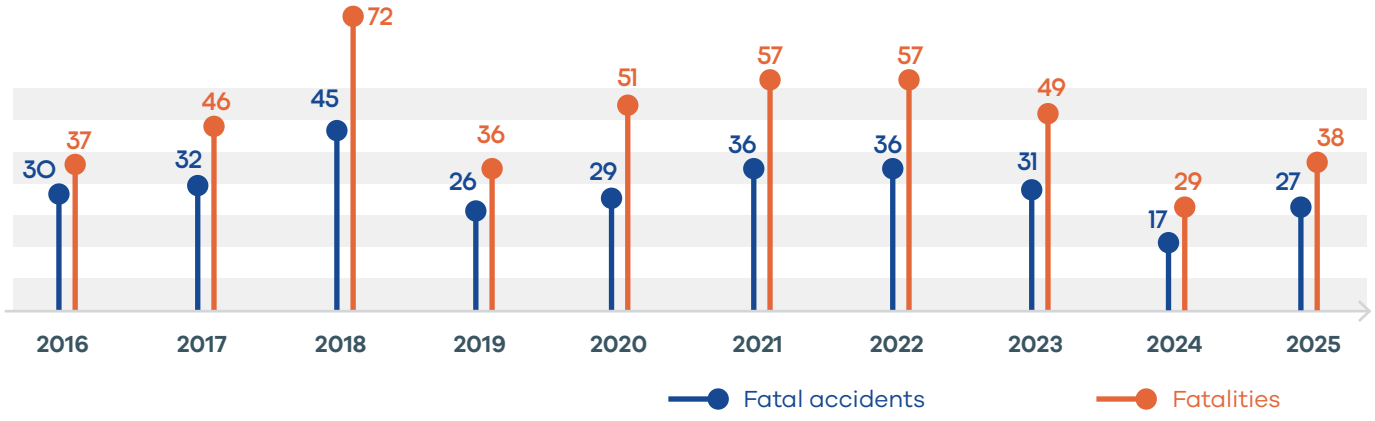
This increase is primarily driven by aeroplane (see paragraph 3.2.2) and glider activities. For the latter activity, six fatal accidents[5] were recorded in 2025, compared to one in 2024. Over the last ten years, only 2017 saw a similar record.

There were no fatal accidents involving general aviation helicopters or balloons in 2025. Moreover, there have been no fatal accidents involving balloons in France, since 2019 (across all types of operation).

For several years now, the BEA publishes, at the beginning of each year, a summary of safety lessons based on the previous year's general aviation reports, broken down by aircraft category. These summaries provide qualitative information that usefully supplement the preliminary data that can be provided in this activity report.

In early 2026, the BEA also began publishing thematic pages dedicated to light aviation.

**Evolution from 2016 - 2025 in general aviation fatal accidents (all aircraft categories)**




5. *This number includes the accident to the Robin DR400 registered F-HRPB and to the Schleicher ASW20 registered D-2020 on 16/08/2025 at Saint-Pons during a tow flight. It is included in the aeroplane - aerial work/specialized activity in the table on page 6.*


Accident to the Piper PA23 registered N14040 on 26/12/2024 at Saint-Barthélemy airport - report published in 2025

### 3.2.2 Aeroplanes: overview of fatal accidents in general aviation

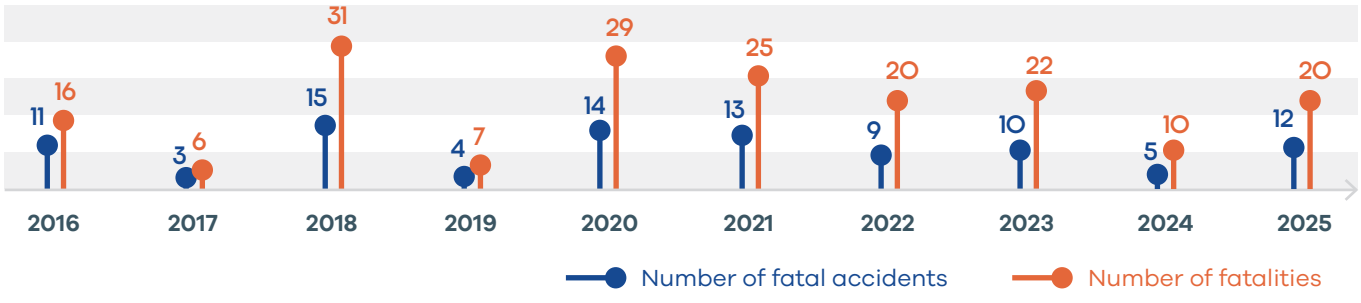
Twelve fatal aeroplane accidents were recorded for 2025, compared to five in 2024, resulting in twenty fatalities, while ten people were fatally injured in the previous year. This figure places 2025 slightly above the average number for the previous ten years, both in terms of the number of fatal accidents and the number of victims.

So far, these accidents, few in number and the preliminary data collected do not make it possible to identify common themes.

Nevertheless, we will mention:

- the mid-air collision with a paraglider, near the mountain airfield toward which F-BAYP was heading; this accident relates to the theme frequently addressed by the BEA of co-activity, while broadening it beyond the use of the same aerodrome;
- a possible decrease in engine power which is being closely examined in three investigations;
- a loss of external visual references which is suspected in two cases;
- the loss of control of F-GGQQ, which occurred during manoeuvres in a mountainous area;
- four accidents involving aircraft holding a certificate issued to kit-built aircraft.

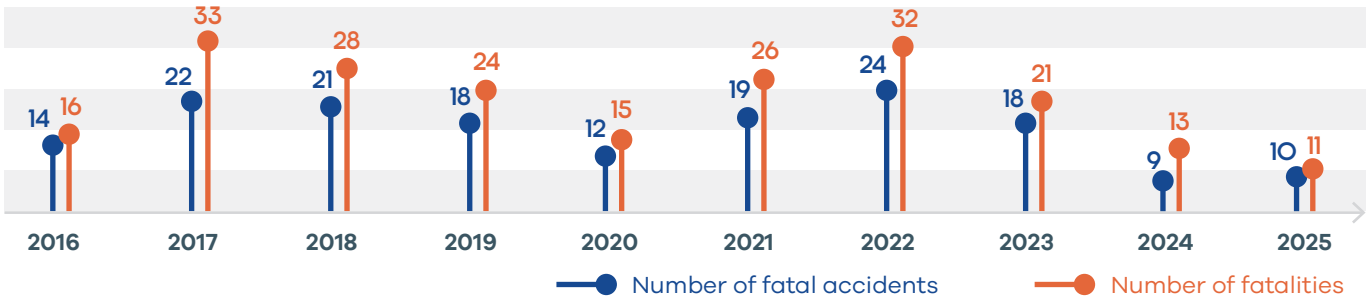
**Trend in fatal general aviation accidents (aeroplanes only) from 2016 to 2025**



### 3.2.3 Microlights: overview of fatal accidents in general aviation

Ten fatal microlight accidents were recorded in 2025, compared to nine the previous year. These figures are a lot lower than the average observed over the past ten years. There were eleven victims in 2025: the lowest number recorded over this same period.

**Trend in fatal general aviation accidents (microlights only) from 2016 to 2025**




As in 2024, only class 1 (paramotor) and class 3 (fixed-wing) microlights were involved in fatal accidents in 2025. In accordance with the BEA's new investigation policy, not all of these fatal accidents were systematically investigated. For those where an investigation was opened, the information available at the time of writing this document had not made it possible to identify any major patterns. Four fatal accidents occurred during take-off, two in the aerodrome circuit and one (paramotor) during training for a competition.


Accident to the Cessna 172 registered F-GYDS on 27/06/2025 near Châteauroux-Villers AD

# 04

# Safety recommendations

# 4.1 General context

According to ICAO Annex 13 (13th edition of July 2024), a safety recommendation is *"A proposal of an accident investigation authority based on information derived from an investigation, made with the intention of preventing accidents or incidents and which in no case has the purpose of creating a presumption of blame or liability for an accident or incident. In addition to safety recommendations arising from accident and incident investigations, safety recommendations may result from diverse sources, including safety studies."*

The recommendations are addressed to various entities including authorities, manufacturers, operators or air navigation service providers, with the intention that the recipients take the appropriate measures to prevent events from occurring in similar circumstances.

**Follow up of safety recommendations**

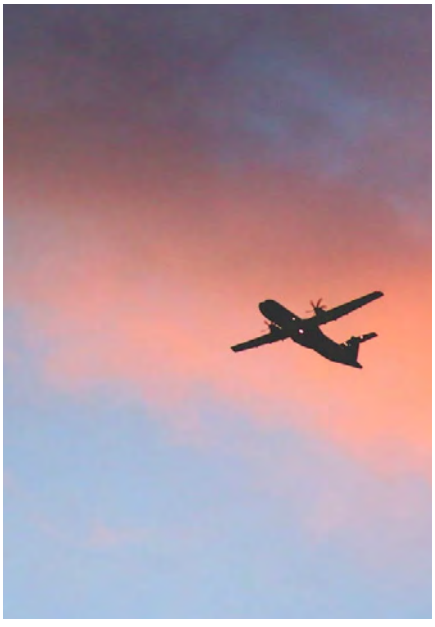
The provisions of European regulation No 996/2010 require for European Union Member States, that the recipient of a safety recommendation acknowledge receipt and inform the authority which issued the recommendation of the actions taken or under consideration and the time necessary for their implementation and where no action is taken, the reasons therefore.

The recipient's response must be addressed to the issuing authority within 90 days of receipt of a safety recommendation.

The issuing authority is under the obligation to inform the recipient, within 60 days of receiving its response, whether or not it considers it adequate.

In addition to these regulatory obligations, the BEA follows up each recommendation through exchanges with the recipient until the decision to close the file is taken. The interval between a safety recommendation being issued and the closure of its follow-up file is variable, ranging from a few months to several years. Depending on the case, the file may be closed based on an agreement or disagreement with the recipient.

Recommendations issued by Member States of the European Union, as well as those issued by third countries to an entity of the European Union, are recorded and tracked on a European platform called SRIS2 (*Safety Recommendation Information System 2*).

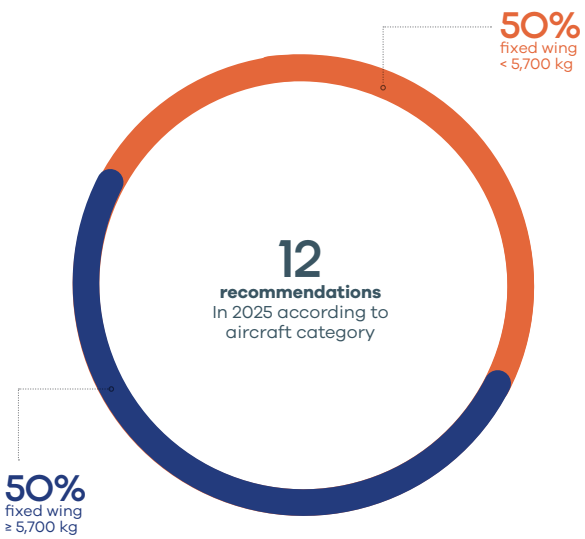


# 4.2 Safety recommendations issued


**12** **recommendations**
issued by the BEA in 2025

### Breakdown by aircraft category

These recommendations were made in the context of five investigations into accidents or serious incidents.

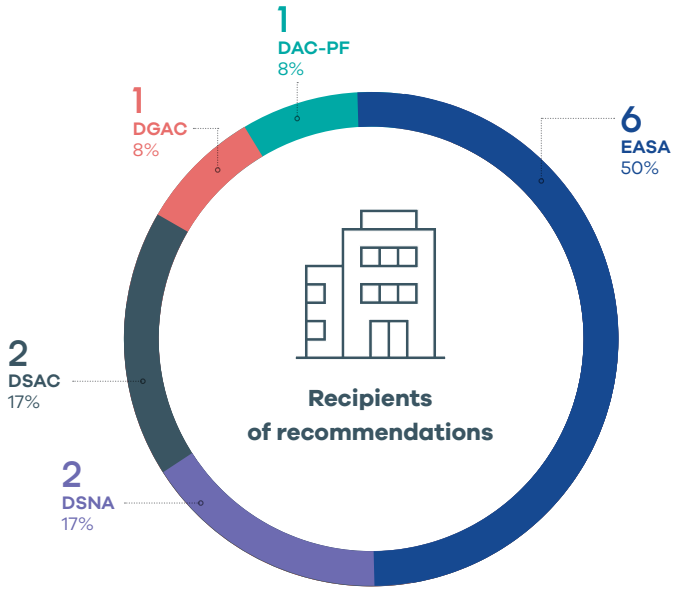


**Breakdown by recipient**

Safety recommendations were sent to five entities.

Six of these recommendations were addressed to EASA, i.e. half of all the recommendations issued in 2025.

***Note:*** *The DAC-PF corresponds to the French Polynesia civil aviation directorate.*




**Breakdown by type of operation**

The breakdown by type of operation is as follows:

- six recommendations were issued in the scope of investigations concerning aircraft used in commercial air transport;
- five recommendations were issued in the scope of investigations concerning aircraft used in non commercial operations;
- one recommendation was issued in the scope of an investigation concerning an aircraft operated in the context of a revenue flight.

**Breakdown of recommendations by topic**

The safety recommendations principally cover eight areas:

Procedures and aircraft design and manufacturing requirements
- *3 recommendations*

Addition of equipment to improve safety level
- *2 recommendations*

Equipment consistent with a weather information level
- *2 recommendations*

Procedures and requirements concerning traffic management and control
- *1 recommendation*

Organization of safety management system in air navigation field
- *1 recommendation*

Maintenance procedures and requirements for aircraft
- *1 recommendation*

Operating procedures and requirements for aircraft
- *1 recommendation*

Aircraft certification
- *1 recommendation*

# Review of BEA investigation reports with safety recommendations published in 2025

Five reports published in 2025 contained safety recommendations.
They concern the following occurrences:

## COMMERCIAL AIR TRANSPORT

| Registration Occurrence | Recommendation number | The BEA recommends that: |
|---|---|---|
| EC-NGC/F-HBLD<br><br>Undetected in-flight transponder failure, following of a conflicting flight path in RVSM airspace without radar contact. | FRAN-2025-009 | > EASA detail, in the certification specifications CS-ACNS, the alert systems required in the cockpit to facilitate the pilots' detection of a transponder malfunction whatever the aircraft certification criteria (CS 25 and CS 23 for example). |
| | FRAN-2025-010 | > EASA, in the scope of action RMT.0744 of the European Plan for Aviation Safety (EPAS), develop detailed specifications for ATM/ANS ground equipment in order to improve the alerting systems regarding the loss of a radar track, facilitate the detection of these losses and thus allow controllers to take the appropriate actions. |
| | FRAN-2025-011 | > The DSNA develop a risk representation model as a tool to support a more comprehensive approach to safety management, enabling reciprocal feedback between reactive and proactive approaches in order to identify and analyse threats at the interface between operational and technical components. |
| | FRAN-2025-012 | > EASA assess the actual use of compulsory reporting points in European airspace in accordance with existing regulatory provisions and expectations, with the aim not only of promoting the results of this assessment to air operators and ANSP, but also of encouraging these organizations to take action based on the examination of these results. |
| F-ORVS<br><br>Non-stabilised approach, windshear, opposite dual inputs, hard landing, balked landing. | FRAN-2025-005 | > The DGAC, in coordination with Météo-France, ensure that on the various airports in French Polynesia, an adequate meteorological service level is provided, in order that inter-island commercial flights are carried out safely and in accordance with requirements. |
| | FRAN-2025-006 | > Pending the upgrading of the meteorological service on French Polynesia airports, the DAC ensure that crews who receive meteorological parameters from facilities not certified by Météo-France are fully informed that the values of these parameters have not been validated. |

| OTHER TYPES OF OPERATION | | |
|---|---|---|
| Registration<br>Occurrence | Recommendation number | The BEA recommends that: |
| 67BVN<br><br>Loss of control during a stall exercise, activation of the airframe parachute, in instruction | FRAN-2025-007 | > The DSAC make the implementation of Service Bulletin ZBWT9 31A / 2024 (Installation of safety equipment – stall strips) mandatory for all Dynamic WT9 microlights which are not so equipped. |
| | FRAN-2025-008 | > The DSAC impose, for newly designed Class 3 microlights, special airworthiness conditions regarding the microlight's approach and stall behaviours. |
| F-CFFF<br><br>Loss of pitch control during take-off, collision with ground, during a competition flight. | FRAN-2025-002 | > EASA impose the locking of L'Hotellier connectors, notably by means of a locking pin, on aircraft using these connectors for critical parts such as the flight controls. |
| | FRAN-2025-003 | > EASA, in coordination with L'Hotellier, ensure that the maintenance instructions contained in IMA 10.01 are effectively distributed to all type certificate holders using L'Hotellier connectors on their aircraft. |
| | FRAN-2025-004 | > EASA raise awareness among type certificate holders of light aircraft about the need to monitor updates to maintenance information published by critical component suppliers. |
| N15902<br><br>Collision with the surface of the water shortly after take-off | FRAN-2025-001 | > The DSNA ensure that the ANS-AG authorizes flight plan activation by telephone with the BRIA before the aircraft actually takes off and its closure after landing. |

Accident to the Morane Saulnier MS73 registered F-AZXU on 06/06/2025 on Rochefort-Charente-Maritime AD

# 4.3 Follow-up of safety recommendations

## Follow-up of recommendations issued in 2025

As regards the follow-up to the 12 recommendations issued by the BEA in 2025:

- Two recommendations received a response from the recipient, which were considered "adequate" by the BEA and their follow-up files were closed.
- Two recommendations received a response from the recipient, which were considered "partially adequate" by the BEA, their follow-up files were kept open pending information about the progress of the measures taken by the recipient.
- Three recommendations received a response from the recipient indicating that an action was underway; the BEA has reserved its opinion and kept the follow-up files open pending further information.
- Five recommendations had not received a response from the recipient at the time of writing this report.

*Note: for recommendations issued at the end of 2025, the response time for the recipient , set at three months, had not expired at the time of writing this document.*

## Follow-up of recommendations issued before 2025

- In 2025, the BEA closed 17 safety recommendations based on the responses or additional information to the responses.
- Fifteen of them were closed as the responses were considered "adequate". In particular, the publication of the order of 17 February 2025 concerning microlight operating conditions meant that six of these safety recommendations could be closed.
- The other two recommendations were closed while the responses were considered "inadequate" or "partially adequate".
- The BEA considered that a certain number of the other responses that were received required additional information or more progress in the action plan in order to be appraised. The follow-up to these recommendations was kept open pending this information.

Accident to the Boeing 737 registered EC-NLS operated by Swiftair on 24 September 2022 at Montpellier-Méditerranée

05

# Laboratory activities

Engineering department

BEA

5.1

# Overview of Engineering department activity in 2025

The role of the Engineering department is to carry out different types of examinations. It comprises two sections:

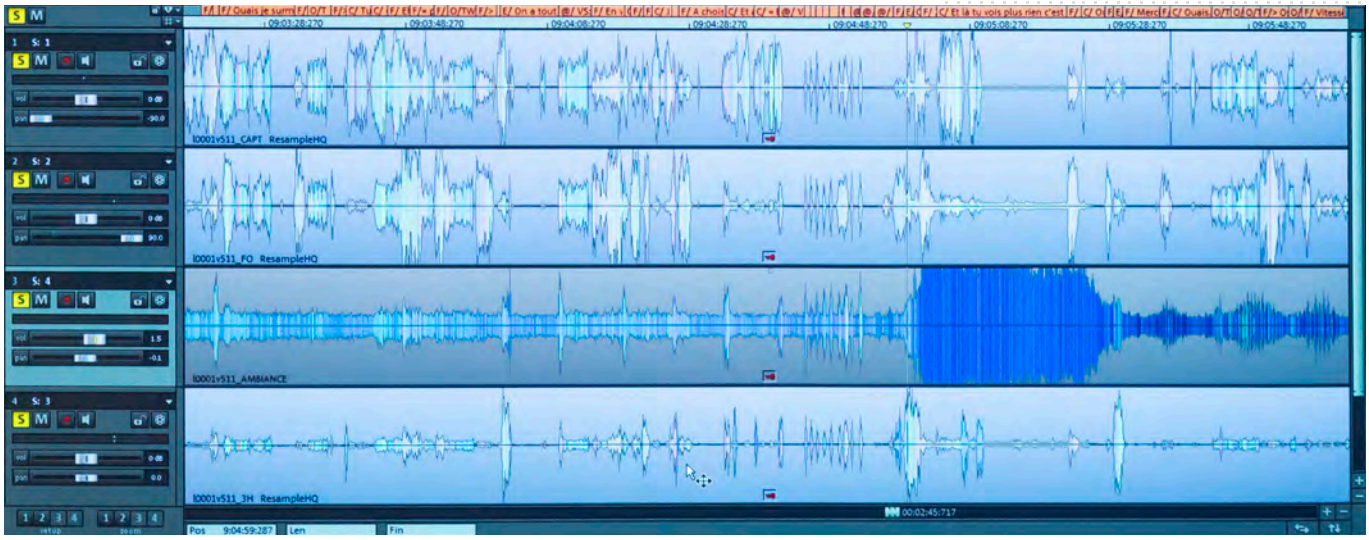
- the flight recorders and avionic systems section (PESA) which examines various electronic systems (on-board recorders, avionic systems, ATM recording systems, electronic equipment carried on-board or used on the ground, smartphones, cameras) to retrieve all usable data and analyse it for the needs of the investigations;
- the structure, equipment and engines section (PSEM) which examines the wreckages or parts of the wreckages, aircraft parts (engines, propellers, equipment, etc.) and fluids (fuels, oils, hydraulic fluids) in order to establish the factual data required for the investigations.

The examinations performed by the Engineering department may be carried out:

- in the scope of investigations conducted by the BEA;
- in the scope of investigations conducted by foreign authorities where the BEA has appointed an ACCREP (see paragraph 1.1);
- in the scope of investigations conducted by foreign investigation authorities where the BEA has not appointed an ACCREP: the BEA then provides technical assistance to the third-party country.

In 2025, a total of 493 examinations of all types were carried out. The majority of these examinations were carried out by the investigators of the Engineering department. Some were carried out in external (private or public) partner centres under their supervision: this is the case, for example, for fuel and oil analyses or the examinations carried out on certain equipment or computers.

**493**
**examinations carried out**
In 2025



5.2

# Work by PESA (flight recorders and avionic systems section)

## 5.2.1 Flight recorders

In 2025, 21 cockpit voice recorders (CVR), 33 flight data recorders (FDR) and 10 combined recorders (CVFDR) were read out at the BEA for a total of 64 recordings. Along with this, twenty-four recordings by maintenance recorders (QAR/DAR) were also read out.

A large proportion of these recordings concerned investigations carried out abroad either where the BEA participated as ACCREP or where they provided technical assistance to third-party countries.

| | BEA investigation | BEA ACCREP | Technical assistance | Total |
|---|---|---|---|---|
| CVR recordings read out at the BEA | 9 | 11 | 1 | 21 |
| FDR recordings read out at the BEA | 10 | 22 | 1 | 33 |
| CVFDR* recordings read out at the BEA | 5 | 3 | 2 | 10 |

* The CVFDR is a recorder containing CVR and FDR data, also called a combined recorder

## 5.2.2 Avionic systems, video, PC and smartphone recordings

In 2025, 135 computers[6] were read out by the avionics laboratory in addition to the 69 tasks carried out on photo/video and PC/smartphone recordings, for a total of 204 examinations.

| | BEA investigation | BEA ACCREP | Technical assistance | Total |
|---|---|---|---|---|
| Computers | 101 | 31 | 3 | 135 |
| PC/smartphones | 41 | 0 | 0 | 41 |
| Photo/video recordings | 13 | 15 | 0 | 28 |

## 5.2.3 ATM recordings

In 2025, 52 occurrences gave rise to work on air traffic management (ATM) data, including radar data, air traffic control communications and 10 examinations of data from Flight Radar 24 type Live Tracking systems. This type of work mainly concerned investigations carried out by the BEA.

ATM work according to type of investigation can be broken down as follows:

| | BEA investi-gation | BEA AC-CREP | Technical assistance | Total |
|---|---|---|---|---|
| Number of occurrences | 49 | 3 | 0 | 52 |

6. *The term "computer" groups various avionic equipment and the Global Navigation Satellite System.*

# 5.3 Work by PESM (structure, equipment and engines section)

In 2025, 149 examinations were carried out by PESM (compared to 156 examinations in 2024). These examinations were principally carried out at accident sites and at the BEA's premises or sometimes at its partners' premises (public bodies, private laboratory, manufacturers).
The examinations can be broken down as follows:

| | BEA investigation | BEA ACCREP | Technical assistance | Total |
|---|---|---|---|---|
| Examinations of wreckages | 30 | 3 | 0 | **33** |
| Examinations of engines and propellers | 15 | 3 | 0 | **18** |
| Examinations of fluids | 9 | 0 | 0 | **9** |
| Examinations of equipment | 71 | 18 | 0 | **89** |

# 5.4 Engineering department development work

For many years now, the two sections of the Engineering department (PESA and PSEM) have been involved in development work aimed at both adapting to the new technologies on aircraft in service and in their equipment and improving the quality and speed of the examinations and analyses.

This work is often carried out internally by the department's investigators some of whom have experience in research and development. This work may also be carried out in collaboration with research bodies or manufacturers. Each year, the BEA welcomes a number of trainee students who find themselves in an ideal environment to put into practice the theoretical skills acquired during their studies.

## 5.4.1 Development work by PESA

PESA's development work in 2025 primarily focused on the following areas:

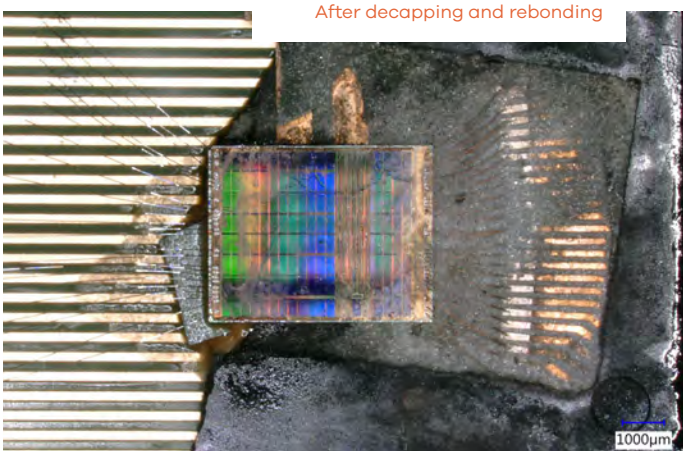
- improving data extraction and decoding capabilities;
- processing of images and videos;
- automating the transcription of audio recordings.

**Data extraction and decoding capabilities**

The BEA continuously invests in maintaining and expanding its data extraction capabilities. Regarding damaged memory cards, in 2024 the BEA acquired a laser machine and a chemical etching machine enabling precision operations such as the decapping of electronic components. These tools were implemented in 2025, notably in the context of a helicopter accident investigation. During the examination of the Digital Engine Control Unit, it became apparent that the damage caused by the impact and fire was so extensive that one of the memory components could not be read out using conventional methods. The investigation process consisted of laser and chemical decapping of the component, followed by silicon rebonding[7] .

As part of the ongoing improvement of PESA's tools, major updates to the electrical testing tool for memory components and the data decoding tool for the various systems operated at the BEA were implemented in 2025. In particular, a module for importing conversion/decoding formulas implemented in the older tools was created.

7. *Rebonding is the process of electrically reconnecting (via metal wires) a memory chip to its integrated circuit, after an initial faulty connection or repair operation.*


**Images and videos**

The 3D laser scanner acquired in 2024 is now regularly used. Following the fire which broke out on the Airbus A321 registered HL7763, operated by Air Busan, on 28 January 2025, on the apron at Guimhae, South Korea, the BEA team deployed to the scene conducted a 3D scan of the entire aircraft, including the interior of the passenger cabin, to help identify the source of the fire. This data was fully shared with the South Korean investigation team and may also be used in the future for training purposes.

Half of PESA's video analysis activity involves analysing information from security cameras. Development efforts largely focused on this type of camera which is difficult to calibrate in a laboratory. Reading out the recordings from these cameras requires several steps including the systematic purchase of a new, often expensive, model, and due to the cameras' very long focusing distance, their calibration which can only be performed using images taken from a considerable distance. The BEA laboratory therefore established a methodology for calibrating security cameras using appropriate targets, an optical calibration using the "Open Computer Vision Library" and a georeference measurement of the field of view based on the scanner. The algorithm developed in 2025 is operational and has already been implemented in several BEA investigations.

Two developments relating to the QGIS software for analysing geographic data and creating flight paths for reports were also finalized:

- a module for estimating the glare coefficient in the cockpit by correlating the aircraft's flight path with the sun's position (taking into account terrain, atmospheric refraction, the Earth's curvature, the aircraft's attitude, etc.);
- a module for synchronizing cloud mass layers observed by Météo-France with the aircraft's flight path.

**Automating transcriptions**

Following funding from the French National Research Agency (ANR), the BEA has been coordinating the BLeRIOT (*Bea Lisic Reseda Irit investigation on aerOnautic speech Transcription*) research project since early 2025. This project brings together the DGA[8] Essais propulseurs (RESEDA laboratory), the DGA Essais en vol and the university laboratories IRIT[9] and LISIC[10]. The project aims to address the problem of separating overlapping speech in flight recordings, with the objective of improving intelligibility for human analysis and automatic speech transcription in civil and military aviation. To this end, representative data from CVR must be made available to project partners and the scientific community. However, CVR data is sensitive and protected by French, European and international regulations: as such, it is stored at the BEA on a secure server and is never disseminated externally. To overcome this difficulty, one of the solutions implemented in 2025 at the BEA and at RESEDA was the recording of raw voices (reading out loud of anonymized standard phrases corresponding to actual in-flight conversations) combined with the recording of in-flight noises at the various microphone locations in the cockpit, in order to artificially reproduce recordings with characteristics similar to those of a CVR. The results are expected within the next four years.

Two aircraft on the ground were used to "broadcast" these raw voices through talking-head mannequins placed in the captain's and co-pilot's seats. These mannequins were recorded by their multichannel CVR to reproduce superimposed cockpit speech, as typically encountered in CVR recordings. As the non-superimposed sources of the reproduced superimposed speech are known, they can be used by the IRIT and LISIC algorithms to separate sources and measure intelligibility.

This work serves as preparation for more comprehensive measurements to be carried out in 2026—including the broadcast of calibrated noise in flight—which will provide the university partners with the best possible data for source separation models adapted to the specific characteristics of the CVR audio channel and its flight noise context.

8. *Direction générale de l'armement (Directorate General of Armaments)*
9. *Institut de recherche en informatique de Toulouse (Computer science research institute)*
10. *Laboratoire d'Informatique Signal et Image de la Côte d'Opale (Computer science, signal and image laboratory)*

These recordings aim to reproduce the CVR transmission channel as faithfully as possible, but do not allow for the production of a very large amount of data, as access to aircraft is, among other factors, very limited.
The BEA measured the "impulse" responses of various components in the transmission channel of several aircraft, including the cockpit acoustic response, the microphone response of the pilots' headsets and the CAM (cockpit area microphone) and the electronic response of the audio processors. This was done to model the complete transmission channel and artificially generate large amounts of data based on raw voice recordings and flight noise. This data will improve the algorithms for separating sources and estimating the intelligibility of recordings.

### 5.4.2. PSEM development work

**Replacement of the scanning electron microscope with a field emission scanning electron microscope (FE-SEM)**

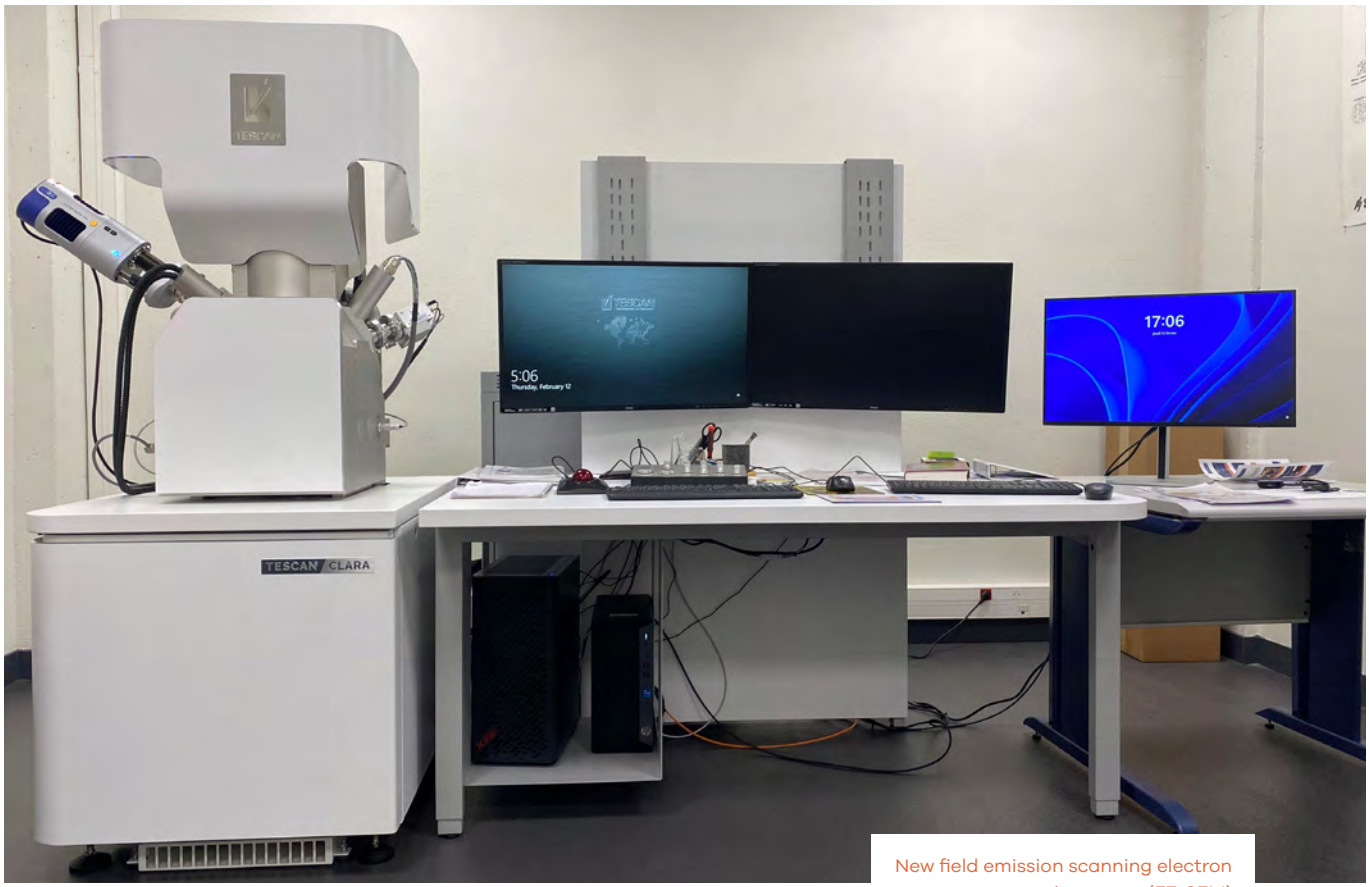
Until the end of 2025, the BEA laboratory used a conventional variable-pressure scanning electron microscope (SEM), acquired in 2009 and equipped with an EDS probe. This type of equipment, essential to the laboratory's analysis capability, is used in safety investigations to determine, in particular, the nature of the ruptures observed on mechanical parts, the characteristics of materials or any contamination that may have caused failures.

However, the maximum resolution of a conventional SEM can be a limitation for certain examinations requiring very high resolution, particularly for counting fatigue striation to date crack propagation. Until now, these analyses were frequently outsourced to external laboratories (industrial or technical centres).

To reinforce its examination capabilities, the BEA acquired a field emission scanning electron microscope (FE-SEM) which was delivered and put into service at the end of 2025.

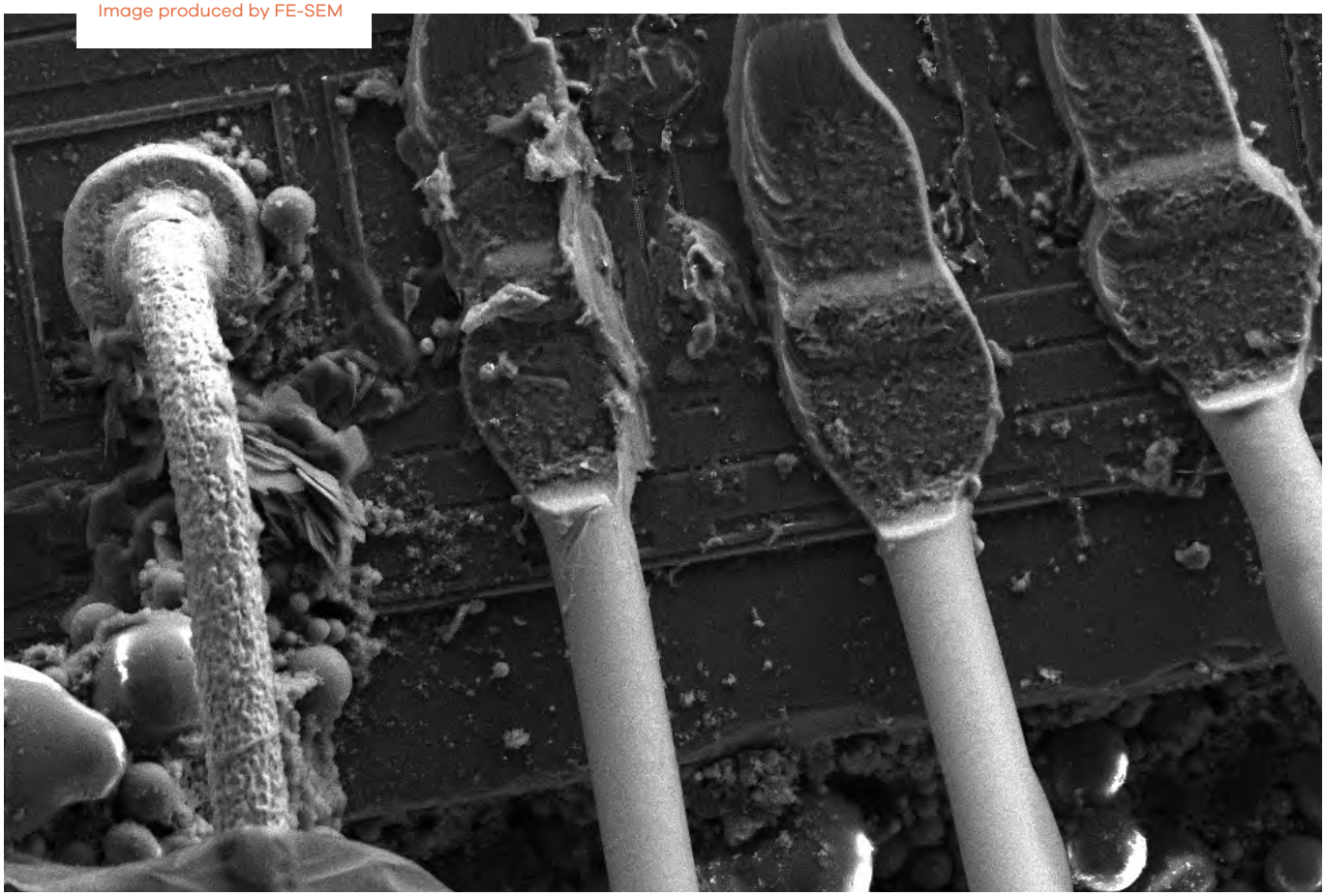
This new equipment offers several operational advantages:

- reduced preparation time before each use, as adjustments are simplified compared to a conventional SEM;
- an electron emitter service life approximately ten times longer, limiting user intervention on the electron gun;
- better compatibility with the equipment used by aviation manufacturers, strengthening the BEA's ability to conduct or guide certain highly technical examinations.




New field emission scanning electron microscope (FE-SEM)

Image produced by FE-SEM



The FE-SEM also provides improved performance:

- a significantly improved theoretical resolution (approximately 0.7 nm compared to 3 nm for a conventional SEM);
- the ability to operate with a low voltage while maintaining a high resolution making it possible to observe fracture faces in composites or electronic boards without needing to metallize the surface;
- better observation of fatigue striations, 20 to 30% of which were undetectable with a conventional SEM, thus improving the dating capability of fatigue cracks and the area of detectability of these phenomena.

Furthermore, in 2025, PSEM continued the "General Aviation & Electrification" development project, which aims to provide the BEA investigators with all the necessary skills and knowledge to manage on-site risks and conduct investigations concerning electrically-powered aircraft.

In 2025, the BEA project was presented to manufacturers, owners and operators as well as research laboratories, emergency services and its foreign counterparts. Confidentiality agreements were signed to allow access to technical documentation and examination contracts were negotiated. The work carried out included battery tests, the development of battery monitoring tools, the acquisition of specific tools and protective equipment with respect to the risks of electrical discharge and secure containers for isolating or transporting damaged batteries. The project will continue in 2026; some areas of reflection remain open, such as the behaviour of a composite fuselage when subjected to electrical current in the event of energization following an accident.

The procedures developed in the scope of this project were put into practice during the investigation opened in July 2025 following the forced landing of a Velis Pipistrel in the Finistère. This is the only electric aircraft currently certified in Europe and around forty are operated in France by flying clubs or flight training schools.

06

# International activities

## Training actions and institutional relationships

BEA 80

The BEA carries out numerous actions on the European and international scene: communication activities through its participation in international conferences, setting up cooperation agreements with foreign investigation organizations, organizing training seminars in France and abroad and participating in working groups in international organizations (in particular the European Union, European Civil Aviation Conference and ICAO).

## 6.1
# Communication activities in the professional field

Every year, the BEA participates in conferences and expert meetings. This allows the BEA not only to spread safety messages arising from investigations that it has led or participated in, but also to make its investigation expertise more widely known internationally. This sharing of lessons drawn from investigations and the keeping of close contact with its counterparts are essential tools for the success of its work during investigations abroad.

The most notable international conferences and meetings in which the BEA participated in 2025 were :

- GA-ASI (General Aviation Air Safety Investigator): in this seminar for international general aviation investigators held in Dallas (United States), a BEA investigator presented a paper on unanticipated failure mechanisms during PA-18H seaplane operations;
- ISASI (International Society of Air Safety Investigators): in 2025, the annual ISASI seminar was held in Denver (United States). Three BEA agents participated to present a paper on the work concerning a loss of separation due to an undetected but indicated transponder malfunction.

From 16 to 18 September, the BEA welcomed five delegations from its counterparts in Albania, Armenia, Kosovo, North Macedonia and Moldova in order to discuss work methods.

## 6.2
# Collaboration with foreign investigation bodies

Through its experience and know-how, the BEA is recognized as one of the primary safety investigation authorities in the world. As such, numerous states regularly consult the BEA for assistance in the correct implementation of standards and practices recommended by ICAO.

It is in this context that it regularly signs Declarations of Intent for Cooperation in investigations into civil aviation accidents, with foreign investigation authorities: in total, 65 cooperation agreements are currently in force, including four which were signed or renewed in 2025:

- two declarations with the safety investigation authorities in South Korea and Nigeria which replaced previous agreements that had become obsolete after these authorities became independent and multimodal;
- two declarations with the safety investigation authorities in Armenia and North Macedonia. These agreements were signed during a visit of several days to the BEA by the representatives of these authorities.

In particular, these cooperation agreements provide for assistance, within the bounds of reasonable limits, in case of a major investigation. The collaboration mainly takes the form of technical assistance from the engineering department (this technical assistance activity is described in chapter 5) or the preparation for ICAO audits in the field of investigations.

## 6.3
# Participation in the work of international organizations

### 6.3.1 ICAO

The BEA plays an active role in several of the ICAO's groups of experts:

- Accident Investigation Group Panel (AIGP): the BEA chairs this group of experts responsible for examining amendments to Annex 13 and to investigation manuals. There was no plenary session of the AIGP in 2025 but several working groups (WG) exist in the AIGP: their activity was conducted normally in 2025, largely through videoconference meetings, which has long been their preferred mode of operation.

The working groups in which the BEA has particularly engaged resources include:

- WG14, which is responsible for proposing standards for Annex 13 and for the ICAO investigator's manual for drafting safety recommendations of global concern (SRGC).

- WG20, which is responsible for analysing the reasons why some investigation authorities do not make all final investigation reports public after accidents involving commercial air transport aeroplanes. This group also works to collect final accident investigation reports from around the world and make them available to all investigation authorities. The BEA has collected numerous final investigation reports, bringing the total to over five hundred reports.

- WG23, which helps ICAO to revise Document 9946 on regional authority investigation organizations (RAIO) to include other investigation cooperation mechanisms (ICM). The progress of the work carried out in 2025 will be presented at the next plenary session of the AIGP.

- WG24, which was created following the accident to the Boeing 737 registered UR-PSR operated by Ukraine International Airlines (flight PS 752) on 8 January 2020 at Tehran to examine the provisions of Annex 13 in the event of an accident linked to an act of unlawful interference and/or in the event of a conflict of interest in the investigation process, when such investigation is conducted by a State responsible, for example, for a missile launch.

- WG25, which deals with providing information to air accident victims and their families Documents prepared in different regions of the world were shared by the BEA.

The BEA chairs WG-14, WG-20 and WG-25.

In addition to the AIGP, the BEA participates in the following groups of experts:

- Flight Recorder Specific Working Group (FLIREC-SWG): this group of experts is responsible for proposing amendments to ICAO Annex 6, particularly with respect to the carrying of flight recorders, the location of aeroplanes in distress and the retrieval of flight data. It held its plenary session on the ICAO premises in Montreal in 2025.

- Occurrence Validation Study Group (OVSG): this group reviews accidents and incidents which occurred the previous year to establish statistics per occurrence category and constitute a database of accidents and incidents which is used by ICAO to establish general statistics regarding global aviation safety.

Zhenya Ter-Vardanyan (Armenia) and Pierre-Yves Huerre signed a memorandum of understanding in September 2025

Flight Recorder Specific Working Group (FLIREC-SWG)

EUROCAE meeting

In addition, certain ICAO regional offices organize meetings or workshops between investigators in their region. France is a member of the investigator cooperation structures in the South Pacific and Asia (APAC-AIG) and North and Central America (NACC-AIG) regions which include its overseas departments and territories. A BEA representative participated in an APAC-AIG meeting in New Delhi in 2025.

### 6.3.2. European Civil Aviation Conference (ECAC)

The Group of Investigation Authorities (ACC), bringing together the 44 Member States of the ECAC, is a forum for sharing feedback. It enables the BEA to give an update on the progress of its investigations or advances in safety resulting from its investigations, with its European counterparts. Two meetings were held in 2025, one in Vienna (Austria) in May and the second by video conference in November. These meetings allowed the BEA to present various aspects of an investigation, such as its experience in investigations concerning mountain operations or work to improve effective cooperation in investigations of accidents involving innovative and disruptive technologies.

### 6.3.3. European Union

Regulation (EU) No 996/2010 created the ENCASIA[11] network of the various investigation authorities in the European Union (as well as the members of the European Economic Area). ENCASIA's primary mission is to strengthen the capabilities and cooperation between the safety investigation authorities of Member States, in order to improve the effectiveness of investigations and the prevention of civil aviation accidents and incidents, particularly through the sharing of experience, the organization of relevant training activities and skill development programs for safety investigators.

Within the framework of ENCASIA's work, the BEA remains a key player in the various permanent working groups. Resources were invested in the following groups:

- Working Group No 1 (ENCASIA communication): a BEA staff member leads this group to propose a communication strategy to promote ENCASIA's work and outputs.
- Working Group No 3 (promoting mutual support among all

11. *European Network of Civil Aviation Safety Investigation Authorities*

European investigation authorities) has the primary objective of ensuring that every air transport accident, regardless of where it occurs in Europe, is properly investigated and that lessons are learned and shared to prevent its recurrence. The ENCASIA mutual support system (EMSS) is an example of a medium- to long-term project in which the BEA is deeply involved.

- Working Group No 5 (Peer Reviews): European Regulation No 996/2010 stipulates that ENCASIA shall implement a Peer Review programme for all safety investigation authorities in the European Union Member States. The working group was therefore set up in 2014 to define an initial framework and launch a review program. This program ran for six years. Following this period, a new framework was defined by Working Group No 5 and a phase two review program was developed: in 2025, as in the previous year, three review panels were set up, with each panel reviewing two authorities: the BEA was among the authorities reviewed (see below). As in previous years, each panel included a representative from the BEA (with the exception of the panel responsible for reviewing the BEA, of course). One of the panels was chaired by a member of the BEA.

- Working Group No 6 (Safety Recommendations): this group is deeply involved in the evolution of the new version of the European ECCAIRS repository, which includes a module on safety recommendations. The monitoring of these evolutions is deemed particularly important by ENCASIA in order to ensure the sustained availability of safety lessons (see paragraph 4).

As in previous years, a workshop aimed at achieving these objectives and targeting civil aviation stakeholders likely to be involved in the safety investigation process was organized. This workshop, held this year in Madrid, brought together more than fifty people and focused on interactions with air operators.

### 6.3.4 European Union Aviation Safety Agency (EASA)

The role of EASA is to ensure safe flights and greener civil aviation in Europe. It organizes numerous events each year (seminars, meetings, etc.) in which the BEA regularly participates. Key events in 2025 included:

- the annual meeting between European safety investigation authorities (both EU and non-EU member states) and EASA, aimed at improving the coordination of safety investigations, exchanging information on the past year's events, reviewing the follow-up of safety recommendations issued by the investigation authorities and disseminating information from EASA to European investigation authorities;

- the annual meeting between EASA and the US Federal Aviation Administration (FAA).

### 6.3.5. EUROCAE[12]

EUROCAE is an European organization that publishes reference documents on the specifications for on-board systems. It works in close coordination with the RTCA[13], its American counterpart, in many fields. The EUROCAE and RTCA documents are written by representatives of the aviation community.

The BEA actively takes part in several working groups which held their meetings by video-conference or face-to-face at the EUROCAE headquarters in Saint-Denis in 2025. A notable example is WG-118, created in 2020, which revised the specifications for flight recording systems (ED-112A) and lightweight flight recording systems (ED-155) and has begun developing new specifications for recording unmanned aircraft systems (UAS) and remotely piloted aircraft systems (RPAS), as well as specifications for data transmission systems from flight recorders to the ground.

12. *EURopean Organisation for Civil Aviation Equipment.*
13. *Radio Technical Committee for Aeronautics.*

## Peer review and audit

Two major international events concerned the BEA in 2025:

- a Peer Review by the European Network of Civil Aviation Safety Investigation Authorities (ENCASIA);
- a USOAP audit conducted by ICAO.

**Peer Review**

The peer review was conducted by ENCASIA WG-5 (see paragraph 6.3.2). Carried out by a panel composed of three people from different safety investigation authorities belonging to ENCASIA, it took place in several phases:

- completion of a questionnaire of approximately 80 questions by the BEA;
- review of the questionnaire by the panel;
- a site visit by the panel, which took place at the BEA in early October, lasting one and a half days;
- writing up of the report by the panel.

This assessment focused primarily on the BEA's capability to conduct investigations into major air transport accidents.

The assessment report was being finalized at the time of writing this document.

**ICAO audit**

The ICAO audit of France took place from 19 November to 2 December 2025 (ten working days). It covered numerous topics related to civil aviation, including the "accident investigation" component.

An auditor was present at the BEA for eight working days during this period. The ICAO audit is a highly formal exercise. The "accident investigation" component is based on an 83-item questionnaire. Evidence supporting the answers to each question must be submitted by the audited state's agencies.

The final audit report was being finalized at the time of writing this document.

The peer review and audit are particularly important because their results will be made public, notably the results of the ICAO audit which will be published on its website. They therefore have a direct impact on the image and credibility of the BEA.

# 6.4 Investigator training organized by the BEA and BEA participation in ENAC training

Each year the BEA organizes investigator training courses.

- Two identical two-week training sessions in "Basic Investigation Techniques": these courses are primarily intended for newly assigned BEA agents and field investigators (see paragraph 1.2.5). Two places are systematically reserved in each session for the air transport gendarmes (GTA) and, subject to availability, places are offered to French-speaking foreign investigators: investigators from the Gabon investigation authority followed the 2025 courses.

- One advanced training course for commercial air transport investigators: this two-week COMATSI (commercial air transport safety investigation) training is intended for experienced investigators and is given in English. Twenty-three participants followed this training in December 2025, namely:
  - five BEA investigators,
  - ten investigators from foreign States (Canada, China, Cyprus, Lithuania, Mozambique, Nigeria and the Netherlands),
  - an investigator from the BEA-É (the State Aviation Accident Investigation Authority),
  - seven industry (Airbus Helicopters and Daher) investigators and airline operator (Air France, HOP! and Transavia) investigators.

In common with the previous sessions, the diverse backgrounds of the participants which fostered fruitful exchanges and enhanced the training for all investigators, were particularly appreciated.

It should be noted that the two investigators from China and Mozambique were able to participate in the COMATSI training thanks to funding from the DGAC through partnerships between France and these two countries.

The COMATSI training is organized in coordination with the National School of Civil Aviation (ENAC). The BEA has signed a framework agreement with the ENAC, which stipulates that specific agreements can be signed to define joint actions. This training is the subject of specific agreement No 1 concerning the collaboration to be implemented for training in commercial air transport. It should be noted that under the framework agreement, participants other than BEA investigators now pay for this training.

Furthermore, the BEA contributes each year to various training courses offered at the ENAC, in the form of information modules on safety investigations:

- ENAC engineers' course (IENAC major OPS - 2nd year): two half-days per year;
- ENAC apprenticeship engineers' course (ENAC-APPR - 2nd year): one half-day per year;
- Control engineers' course (Management and Control of Air Traffic – MCTA): two half-days per year;
- Senior technician adaptation course (GSEA): students come to the BEA in groups for four sessions per year;
- Senior technicians' course (ADATS): one half-day per year;
- MS-ASAA (Aviation Safety/Aircraft Airworthiness) master: one half-day per year.

# 6.5
# Relations with judicial authorities

In 2025, the BEA's General Secretary organized several meetings with various judicial bodies, including the Reims court of law, the Paris court of appeal, the criminal chamber of the court of cassation (the supreme court of appeal) and the Paris mass accident unit.

The BEA also proposed a three-day training course for magistrates concerned by the subject of mass accidents.

Fifteen magistrates attended this first session as part of their recurrent training. This course was a complement to the one organized by the DGAC on aeronautics and aerospace, in which the BEA also participated.

The purpose of these various initiatives was to raise the magistrates' awareness of the specificities of a safety investigation, its mechanisms and its obligations.

These meetings allowed both the BEA and the judicial authorities to better understand their respective obligations and working methods prior to a major investigation, during which mutual understanding among the various stakeholders is crucial.

# Institutional relationships
# Coordination between the BEA and the State services in the scope of aviation accidents

The coordination between the BEA and the State services is structured by the preliminary BEA-DGSCGC agreement of 18 May 2021 and the Interdepartmental Letter INTK1701919J of 30 January 2017. In this scope, the ORSEC plans relating to aviation accidents are drawn up and updated using models prepared by ARCC-Lyon and the DGSCGC, and reviewed by the DSNA/SAR department and the BEA.


The BEA participates in ORSEC exercises organized at aerodromes in order to prepare the update of specific provisions (DSOA) by the prefectures, as well as in exercises organized by air operators and aerodrome operators.

Exercises conducted in 2025 showed that the knowledge which certain State authorities have, of the roles and prerogatives of the aviation authorities involved in an air accident could be improved.

The south civil defence authorities welcomed the investigators from the BEA's Aix-en-Provence branch in order to share knowledge that can be mobilized in the event of an air accident. Similarly, the BEA's presentation at a regional meeting of the 21 SIDPC (Provence-Alpes-Côte d'Azur, Occitanie and Corsica) aimed to improve coordination between prefectural services and the BEA.

The BEA also strengthened its relationships with the technical services of various institutions, such as the National Gendarmerie (CNING) and the Mediterranean maritime prefecture.

Finally, the BEA contributed to the sharing of experience in managing search and rescue (SAR) operations, particularly within dedicated working groups (for example, SAR feedback groups) and at the annual SAR interministerial meeting.

**Meaning of abbreviations and acronyms:**

| | |
|---|---|
| **CNING:** | National gendarmerie nautical training centre |
| **DGSCGC:** | General directorate for civil defence and crisis management |
| **ORSEC:** | Disaster response plan |
| **DSOA:** | Specific ORSEC provisions for airports |
| **DSO-SATER:** | Specific ORSEC provisions for air-land rescue |
| **SAMAR:** | Air-sea rescue |
| **DSNA-SAR:** | Search And Rescue department of the air navigation service provider |
| **RIM-SAR:** | Search And Rescue interministerial meeting |
| **ARCC-Lyon:** | Aerial Rescue Coordination Centre |
| **PPI:** | Specific emergency plan (at a Seveso site, for example) |
| **SAR:** | Search And Rescue |
| **SIDPC:** | Interministerial civil defence and protection service |

# 07

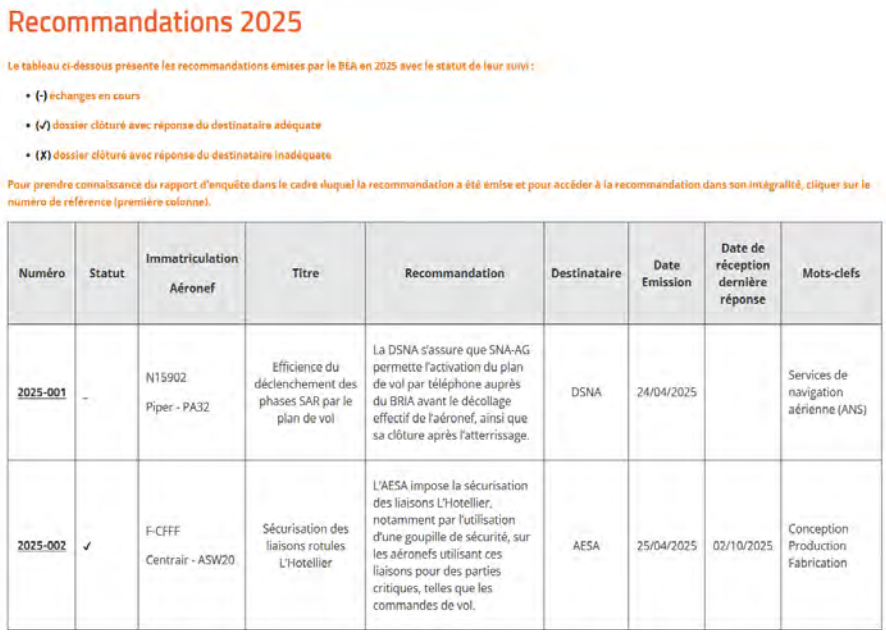
# Communication actions

# 7.1 Direct access to recommendation follow-up

In 2025, the BEA added a page to its website providing direct access to the safety recommendations issued as part of its investigations (dating from 2023 onwards), along with a link to the relevant reports. This page also displays the real-time status of these safety recommendations:

- discussions in progress with the recipient;
- file closed with an adequate response from the recipient;
- or file closed with an inadequate response from the recipient.

The centralized access to this follow-up allows website users to monitor the progress and potential implementation of the safety recommendations issued by the BEA.



## Recommandations 2025

Le tableau ci-dessous présente les recommandations émises par le BEA en 2025 avec le statut de leur suivi :

- (-) échanges en cours
- (✓) dossier clôturé avec réponse du destinataire adéquate
- (X) dossier clôturé avec réponse du destinataire inadéquate

Pour prendre connaissance du rapport d'enquête dans le cadre duquel la recommandation a été émise et pour accéder à la recommandation dans son intégralité, cliquer sur le numéro de référence (première colonne).

| Numéro | Statut | Immatriculation Aéronef | Titre | Recommandation | Destinataire | Date Emission | Date de réception dernière réponse | Mots-clefs |
|---|---|---|---|---|---|---|---|---|
| 2025-001 | - | N15902 Piper - PA32 | Efficience du déclenchement des phases SAR par le plan de vol | La DSNA s'assure que SNA-AG permette l'activation du plan de vol par téléphone auprès du BRIA avant le décollage effectif de l'aéronef, ainsi que sa clôture après l'atterrissage. | DSNA | 24/04/2025 | | Services de navigation aérienne (ANS) |
| 2025-002 | ✓ | F-CFFF Centrair - ASW20 | Sécurisation des liaisons rotules L'Hotellier | L'AESA impose la sécurisation des liaisons L'Hotellier, notamment par l'utilisation d'une goupille de sécurité, sur les aéronefs utilisant ces liaisons pour des parties critiques, telles que les commandes de vol. | AESA | 25/04/2025 | 02/10/2025 | Conception Production Fabrication |

# 7.2 Spotlight on the history of the BEA

As part of the work on the history of the BEA, initiated in the lead-up to its 80th anniversary in 2026, the publication of a series of fact sheets dedicated to its most significant investigations was started. These fact sheets, entitled "Historical Investigations," are available both on the pages dedicated to the investigations and in the "History" section of the website. In 2025, two fact sheets were published regarding the following investigations:

- accident to the McDonnell Douglas DC-10 registered TC-JAV operated by Turkish Airlines on 3 March 1974 in Ermenonville forest;
- accident to the Concorde registered F-BTSC operated by Air France on 25 July 2000 at Gonesse.

The publication of the fact sheet concerning the Ermenonville accident, which remains the deadliest accident in the history of French civil aviation, was accompanied by the restoration and display of the DC-10 cargo door whose ejection caused the accident. For several decades, the BEA had planned to display this door, which had been stored at its facilities. Using a 3D model created by the Communications department, a dedicated display mount was made to present and preserve this door permanently. This accident, even though it occurred a relatively long time ago, remains an illustration of the BEA's mission and the importance of safety recommendations. The NTSB, the American counterpart of the BEA, had in fact conducted an earlier investigation into an accident which shared causal similarities with the Ermenonville DC-10 accident: if the safety recommendation issued in this context had been applied, the Ermenonville accident would not have occurred.


Hold door of DC-10 registered TC-JAV operated by Turkish Airlines damaged in the accident on 3 March 1974 at Ermenonville

## 7.3
# Documentaries

The BEA actively participated in two documentaries produced by CAPA.

Filming took place at Le Bourget on Monday 3 March for a documentary marking the tenth anniversary of the accident to the Airbus A320 registered D-AIPX operated by Germanwings on 24 March 2015 at Prads-Haute-Bléone. First broadcast on 24 April on the RMC Découvertes channel, the documentary was watched by over 400,000 people.

The BEA's Rennes branch and headquarters at Le Bourget also hosted, on 18 March and 24 March respectively, the filming of a new documentary about the accident to the Airbus A330 registered F-GZCP operated by Air France on 1 June 2009 in the Atlantic Ocean, commonly known as the Rio-Paris flight AF447 accident. When it was first broadcast on 27 November 2025 on RMC Découvertes, the documentary was watched by 217,000 people.

## 7.4
# Literary prize

The Aero Club of France literary prize awards were held on Friday, 3 October. Among the 113 books on aeronautics and space published the previous year, the book on the history of the BEA was distinguished by the Charles Dollfus Prize, which recognizes a historical work.

This book, the 25th in the Civil Aviation History series, is the first to receive a literary prize.

To mark the BEA's 80th anniversary in 2026, this book will be republished in digital format with a new cover and a new introduction.

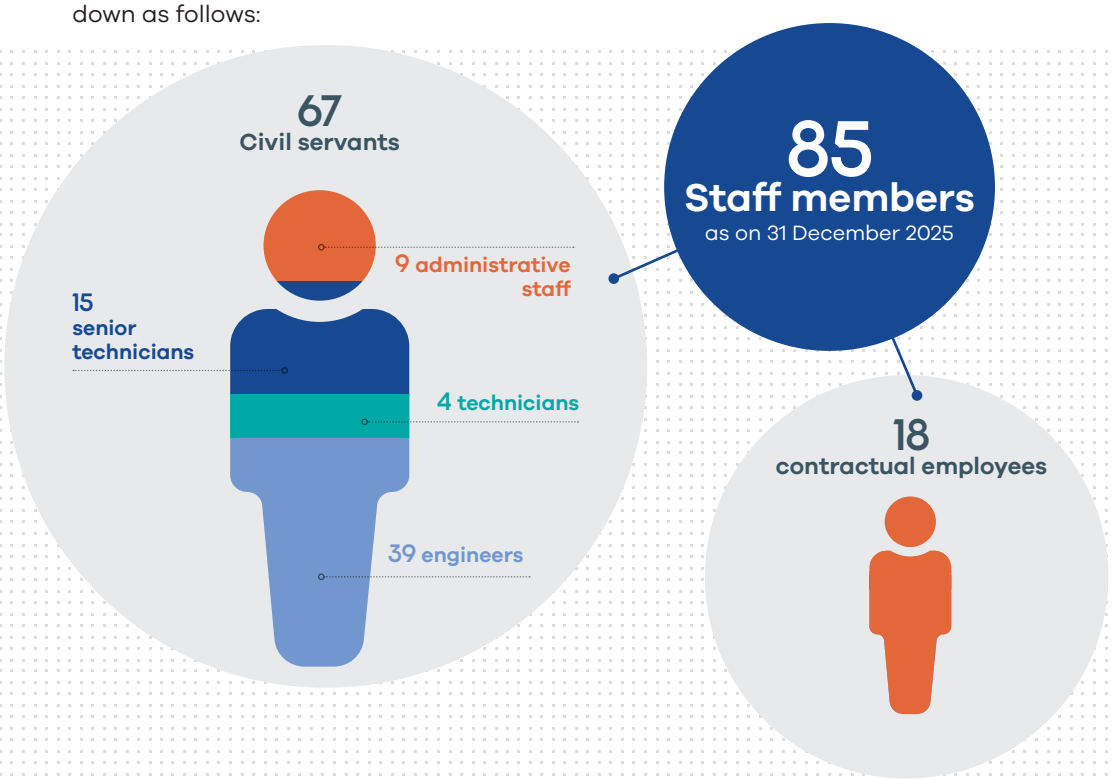
08

# Human Resources
# Finances

# 8.1 Staff

## 8.1.1 Staff on 31 December 2025

As of 31 December 2025, the BEA had 85 members of staff (either civil servants or contractual employees) broken down as follows:




*Eight apprentices and 129 field investigators (90 based in Metropolitan France and 39 based in France's overseas territories) must be added to the above staff figures. The field investigators are trained by the BEA and approved by the BEA director in accordance with the the Code of Transport. They take action at the BEA's request and are under its supervision and authority, generally in general aviation occurrences but sometimes in other scopes (e.g. commercial air transport). Most field investigators hold positions in DGAC departments (or in overseas services) or to be more precise in DSAC Inter-Regional departments. Their actions are covered by a service contract concluded between the BEA and the DGAC, the BEA and the SEAC French Polynesia and the BEA and the DAC New Caledonia.*

**The geographical breakdown of field investigators is as follows:**

Overseas:

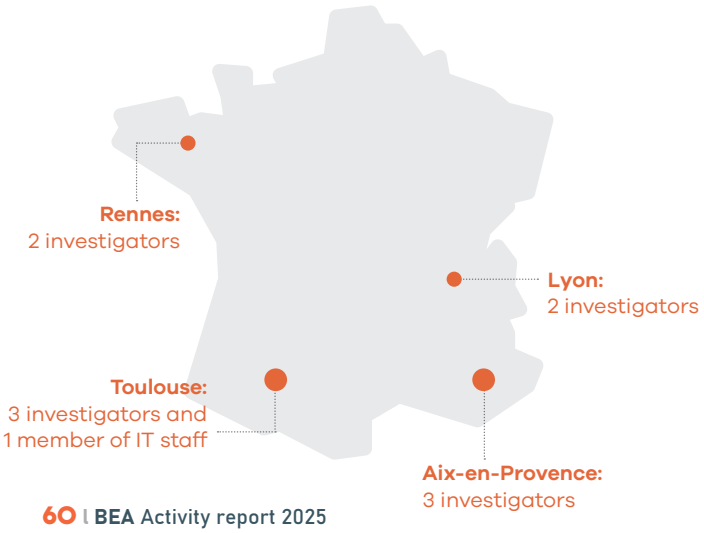
- DAC-NC: 8;
- DSAC-AG: 9;
- DSAC-OI: 9;
- Saint-Pierre-et-Miquelon: 3;
- SEAC-PF: 10;

Metropolitan France

- DSAC-CE: 11;
- DSAC-N: 10;
- DSAC-NE: 8;
- DSAC-W: 10;
- DSAC-S: 16;
- DSAC- SE: 17;
- DSAC-SW: 16;

## 8.1.2 Regional offices

The majority of the BEA's staff work at the Bourget premises, but 11 are based at the different regional branches (staffing on 31 December).




The regional branches enable the BEA to ensure a presence in Metropolitan France and specifically:

- in regions where there is a high level of recreational general aviation activity;
- near the main aeronautical industrial sites.

They are housed in premises made available as part of the service contract between the BEA and the DGAC.

### 8.1.3 Recruitment policy

The high level of technical expertise required by the missions carried out by the BEA, as well as the very broad scope of the fields it covers, gives a particular dimension to the recruitment and training of its staff.

The objective is to recruit motivated specialists and experts with solid skills adapted to the BEA's needs, and consistent with technological progress across the entire aeronautical sector.

Recruitment particularly draws on engineers from the National School of Civil Aviation (ENAC). The BEA's staff also includes graduates from engineering schools and universities, as well as professionals with significant experience in the private sector or within international organizations.

### 8.1.4 Availability of BEA Staff

As explained in paragraph 1.2.4, BEA investigators must be available in the event of a go-team.

The implementation of the necessary support for the go-team (operational equipment, transport and accommodation) must be carried out in a very short timeframe.

This is ensured by the teams in the General Secretary department or by the on-call team if necessary, outside of regular office hours.

### 8.1.5 Work-study apprentices

There were eight work-study apprentices working for the BEA in 2025 (staffing on 31 December 2025) including:

- five work-study apprentices assigned to support functions (human resources, financial resources, logistics, safety and environment and IT);
- and three work-study apprentices assigned to operational functions (communications and management and analysis of investigation data). The number of work-study apprentices, as well as the diversity of the structures that now host them, demonstrates a strong commitment from all departments to the training and skill development of the students. They also reflect the BEA's desire to raise awareness about the different types of work within its walls and to pass on its knowledge and skills.

### 8.1.6 Work shadowing and internships

In 2025, the BEA welcomed 41 students and interns in secondary education and in post-secondary education. These included:

- students in their final year of middle school and first year of high school with the cabinet taking charge of them for one to two weeks in the scope of the government's mandatory work shadowing program. As in previous years, particularly in 2024, the BEA implemented numerous resources for this program;
- interns pursuing two to five years of post-secondary education for internships lasting for longer periods (several weeks or even a few months) in the core activities of the investigation and engineering departments. The BEA continued its commitment to welcoming young people in training, with 11 interns from higher education institutions, representing a variety of schools (ENAC, ISEP, ESME, universities and engineering schools). Internships typically last between four weeks and six months. The interns are generally trained in the latest academic and technological methods (digital technology, AI, etc.). They can thus bring a fresh perspective, new ideas and innovative solutions. They sometimes master emerging tools or fields (data analysis, sustainable development, etc.) that can contribute to the modernization and optimization of the methods and processes implemented at the BEA. Many internships helped students to identify their vocation and resulted in particularly valuable recruitments by the BEA.

# 8.2 Budget

## 8.2.1 Resources

The funds allocated to the BEA come from the initial finance law and amounted to €3.8 million in commitment authorizations (CA) and €3.7 million in payment appropriations (PA), plus carryovers of unspent funds from 2024 minus revoked funds.

In total, the funds available for 2025 amounted to:

- €4,54 M in CA;
- €4.06 M in PA.

The BEA also received grants from third parties for project management (ENCASIA and ANR, see below).

## 8.2.2 Expenditure for the fiscal year

The expenditure for 2025 is detailed in millions of euros in the table below:

| | Initial finance law | | Execution 2025 | |
|---|---|---|---|---|
| | CA (€) | PA (€) | CA (€) | PA (€) |
| **BEA** | 3,801,549 | 3,711,145 | 4,166,745 | 3,932,022 |
| **Operating** expenditure | 2,799,623 | 2,699,281 | 2,605,180 | 2,868,919 |
| **Investment** expenditure | 1,001,926 | 1,011,864 | 1,561,565 | 1,063,103 |

The execution corresponds to the BEA's expenditure which amounts to:

- €4,17 M in CA;
- €3.93 M in PA.

**Operating** expenditure

The total operating expenditure for 2025 amounted to €2.87 million.

The main items of expenditure for 2025 are listed below.

**Service provisions**

This is the largest expenditure. It amounted to €1.06 million and includes the guard and security services, the acquisition of licenses for information systems used by the engineering department and the information system security projects (ISSP).

The expenditure relating to temporary staff is also included under this heading.

**Building maintenance**

The maintenance and renovation of the BEA buildings continued to be a priority, in line with the investments and improvements made in 2024, particularly the ongoing work to insulate the buildings.

**Utilities and electricity**

Reducing energy costs, cutting energy waste and improving energy efficiency are key objectives for the BEA. This commitment was demonstrated by its participation in the CUBE State competition (an energy-saving competition reserved for government departments).

**Travel** expenditure

Travel expenditure amounted to €0.5 million. This expenditure is linked to the BEA's operational activities and work in investigations worldwide.

Travel, transport and accommodation are carefully managed to control costs. However, urgent travel, necessary to ensure investigations are started promptly, cannot, by its very nature, be planned and results in additional costs (Go-team).

**Professional training**

The professional training determined and conducted by the BEA pursues two main objectives, outlined in the five-year training plan:

- to maintain a high level of quality in the carrying out of safety investigations;
- to enable all staff to perform their duties effectively and to support them in their future assignments.

To this end, the BEA allocates an average of 10% of its annual operating budget, or approximately €250,000, to professional training in various fields. The number of training days exceeded 1,000 days.

| Area | Duration | Amount |
|---|---|---|
| Purchasing-Management-Finance | 8.5 | €0 |
| Office software-IT | 150 | €35,000 |
| Communication | 6 | €0 |
| Professional environment | 76.5 | €13,000 |
| Health and Safety Requirements | 99 | €23,000 |
| Legal advice | 2 | €0 |
| Foreign languages | 95 | €17,000 |
| Management | 21.5 | €5,000 |
| Flying | 100 | €102,000 |
| Preparation for competitive exams | 27 | €1,000 |
| Human Resources | 20 | €0 |
| Investigation techniques | 417 | €54,000 |
| **Total** | **1,022.5** | **€250,000** |
| Miscellaneous expenditure | | €8,000 |
| **General total** | **1,022.5** | **€258,000** |

**Flight training**

Flight training represents the BEA's largest training expense, amounting to approximately €102,000 for 100 days of training. This program aims to keep current and develop the operational skills of its staff, both on aeroplanes and helicopters, ranging from the private pilot level to obtaining type ratings on commercial air transport aeroplanes (Embraer 190, Airbus A320 or Boeing 737, in particular), and to flying as a co-pilot for a commercial air transport operator.

Within this framework, numerous agreements have been signed between the BEA and various organizations (particularly flying clubs) to allow staff holding private pilot licenses to keep current and develop their qualifications. These agreements generally allow staff to complete about ten flight hours per year. The objective of this system is to have within the BEA, investigators with a culture, expertise and experience in piloting, which is essential for conducting investigations.

Furthermore, in 2025, as in recent years, several staff have completed additional theoretical and/or practical training: ATPL theory, CPL, IR/SE, IR/ME, FTE/MCC, Type Ratings, etc.

Finally, agreements have been signed with air operators to allow qualified staff to pilot helicopters or work as co-pilots on commercial air transport airliners. The objective is to consolidate significant piloting experience, essential for conducting certain complex technical investigations. For several years now, an investigator has benefited from such an agreement and flies on an Airbus A320 for one week per month. Furthermore, two similar agreements were signed in 2025, allowing two other investigators to fly, one on an Embraer 190 and the other on an Airbus EC145.

**Training in investigation techniques**

The BEA's second largest training expenditure concerned training in investigation techniques, amounting to €54,000. The objective is to enable staff to acquire and keep current, skills in the various aspects addressed during investigations. These training courses, representing more than 400 days, may be conducted with the following organizations:

- manufacturers (SOCATA-DAHER, Airbus, Boeing, ATR, etc.);
- aviation-specific training institutions (Welding institute, Eurocontrol, Mermoz Academy, EUROSAE, etc.);
- operators (Air France, etc.).

Training may also consist of participation in seminars (often international) such as, in 2025:

- Bell - TCB Seminar (Bell Familiarization);
- Exchange Programme - expression of interest form – visiting experts – EASA.

In addition, internal training courses are organized at the BEA, notably the basic investigation techniques course and COMATSI (see paragraph 6.4). These courses, primarily intended for BEA investigators, are supplemented by practical exercises and field experience. They aim to guarantee a high level of expertise, essential for carrying out the investigators' missions and to strengthen the BEA's credibility in conducting its investigations, both nationally and internationally.

Foreign language training, mainly in English, the language necessary to decipher and understand the majority of recordings, supplements this training and represented 100 days of training at a cost of €17,000.

Training in information systems and data management represented a significant portion of the budget, totalling approximately €35,000 for 150 days of training.

Training related to the work environment and safety accounted for the same amount, also totalling 150 days. Finally, training in management, human resources, communication and purchasing/finance represented 80 days of training at a cost of less than €10,000.

**Capital expenditure**

Capital expenditure for 2025 totalled €1.06 million.

The main investment projects included:

- the acquisition of a scanning electron microscope which has increased the engineering department's investigation capabilities, at a cost of €608,000;
- the renovation of the PESA premises in the engineering department, a project that began at the end of 2025 and will continue throughout 2026, at a total estimated cost of €820,000 spread over two years;
- securing of IT data by implementing a transfer system for the BEA's data to an external site;
- the renewal of the vehicle fleet in accordance with environmental policies: this fleet includes vehicles suitable for field missions and the transport of wreckages.

Optimizing and controlling operating costs remains a priority for the BEA. Real estate investments made since 2023, along with the thermal insulation and the cutting of energy waste, have all contributed to achieving this objective.

The acquisition of high-tech equipment, essential for investigations, allows the BEA to expand its investigation capabilities across an ever-wider area and strengthen its autonomy.

## 8.3 External subsidies

**ENCASIA**

The BEA has been designated by the European Commission to manage the administrative and financial aspects of the funds it allocates to the ENCASIA network for its activities, as described in paragraph 6.3.2. The Commission's allocation, paid to the BEA every two years, amounts to €160,000. The BEA must report annually on the proper use of these funds.

**BLeRIOT**

The BLeRIOT project (see paragraph 5.4.1) aims to facilitate the analysis of audio recordings made in aircraft.

The BEA has been designated as the project coordinator. Project participants include the DGA, the University of Toulouse and the Côte d'Opale and the ANR. The ANR has provided a grant of several thousand euros.

8.4

# Work by logistics, safety and environment (PLSE) section

## 8.4.1. Overview of logistics, safety and environment (PLSE) section

The PLSE was created in January 2024. Its objective is to optimize the operations of the logistics unit and the transport unit and to develop occupational risk prevention measures in order to more effectively serve the BEA's missions.

The section promotes coordination and communication between the various departments that comprise the BEA, facilitating cross-functional collaboration between support services and operational staff—a key pillar of the strategic plan.

The PLSE, within the General Secretariat, consists of six staff members: a section head responsible for the BEA's prevention efforts, two risk prevention sandwich students, a member of staff in charge of transporting wreckages, and two members of staff from the logistics unit.

## 8.4.2. Actions for energy transition

As part of the energy transition and in a context of reduced energy consumption, the BEA is also committed to a process of sustainable modification of its technical resources, habits and behaviour, adapted to the specific context of its activity. Daily actions and projects promoting energy efficiency and waste reduction were developed and implemented.

In partnership with the DGAC's eco-responsible public service (SPE) mission and the SNIA, the BEA entered the Cube État competition in 2025 with the objective of achieving the best energy savings through the mobilization of all its staff.

In keeping with this mobilization, an energy audit was conducted. Several actions were implemented as a result of this audit. Some of these actions, including the thermal insulation of the building, had already been identified and initiated at the end of 2023. Furthermore, making the vehicle fleet greener will lead to the acquisition of electric vehicles.

## 8.4.3. Actions to improve working conditions

The PLSE is deeply involved in various projects to improve working conditions and renovate the building, from both a safety and environmental perspective. These projects are implemented in coordination with the other BEA departments. It is also deeply involved in projects on the Le Bourget airport site, working in conjunction and coordination with Aéroports de Paris (ADP).

## 8.4.4. Transporting wreckages

The BEA independently transports all general aviation wreckages or wreckage parts from the accident sites to the Le Bourget site for in-depth examinations which aim to determine whether mechanical or structural failures may have caused the accident. The transport logistics chain is an integral part of the BEA's operational activity. The BEA fleet includes vehicles adapted to its missions, such as a 17 m³ van and its 7.5 m x 2.5 m covered trailer, for a total payload capacity of 3.5 tons per trip.

This activity represents more than thirty missions for the transport unit and approximately 92,000 km travelled, including 9,800 km with the trailer. The van can cover 600,000 km in 10 years of service.

## 8.4.5. Recycling wreckages

The PLSE, in coordination with the PSEM and in partnership with PAPREC, facilitates the handling of aircraft wreckages at accident sites. It monitors their destruction and their potential valorization at the end of the investigation, after the administrative authorization has been given. The process set up for the recycling and valorization of wreckages has been made permanent. In 2025, 11 collection missions were carried out, processing approximately 6.08 tons of wreckage (microlights, certified aeroplanes, helicopters and engines).

### 8.4.6. Occupational risk prevention

This section's occupational risk prevention missions contribute to maintaining the safety as well as the physical and mental health of BEA staff both on and off the premises. These missions, focused on providing advice and support, are carried out in coordination with the work doctor and social worker from the DGAC, the Ministry's occupational health and safety inspector and all BEA staff holding support and operational positions.

Prevention efforts revolve around regulations, updating the single occupational risk document, developing resulting action plans, supervising and implementing these actions, conducting on-site risk briefings and feedback sessions, organizing and monitoring PPE committees and other working groups, monitoring work on psychosocial risks, improving methods and implementing all practical and operational measures that contribute to the continuous improvement in health, safety and working conditions.  A road risk analysis was started at the end of 2024. It will continue until 2026, leading to the implementation of the road risk prevention plan (PPRR).

### 8.4.7. Security

Finally, security issues, due to the sensitive nature of the BEA's activities and the evolving nature of threats, were also reassessed. The logistics unit thus fully oversaw the modernization and maintenance of the BEA's video surveillance system infrastructure.

BEA

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