

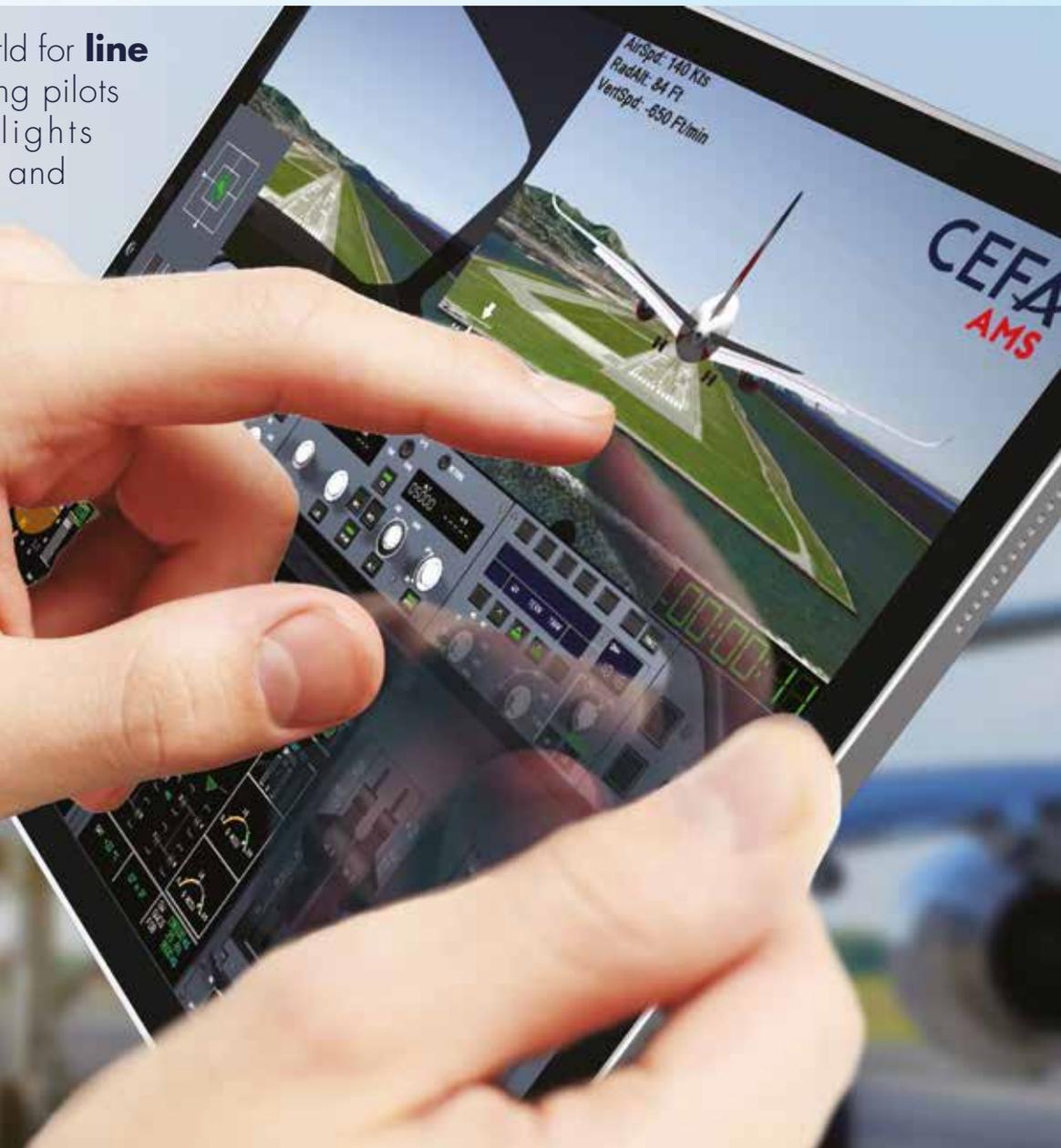
The logo for CEFA AMS, featuring the word "CEFA" in a large, dark blue, sans-serif font with a stylized swoosh under the "A", and "AMS" in a smaller, red, sans-serif font below it. A dark blue triangle is positioned to the left of the text.

CEFA
AMS

LINE OPERATIONS
TRAINING & SAFETY

REPLAY YOUR FLIGHTS RIGHT AFTER LANDING!

The 1st tool in the world for **line operations** allowing pilots to recreate own flights on tablets whenever and wherever wanted!



TURN EACH FLIGHT INTO A TRAINING OPPORTUNITY!

CEFA AMS, THE EXPERIENCE ACCELERATOR

UNTIL NOW, CREW DEBRIEFING WAS BASED ON PERCEPTION AND PILOT'S MEMORY ONLY...



Until today, pilots could debrief after a flight with the only help of their own perception and memory, which can erode over time.

Yet, accurate debriefing is a key factor for understanding. Studies have shown that it is by far the most important part in a **learning process**.

Now, for a gold standard debriefing, it is necessary to rely on **factual data**.

And how to present factual data in the best way so that everybody can understand what happened at first sight?

... The answer is a 3D animation, like a true movie with all the details of cockpit instruments, visual and aural warnings, pilots' actions, flight control actions, weather conditions, etc.

Based on the real-world data from the flight recorder, such an animation is both **reliable** and **easy to understand**.

CEFA AMS is a line operations tool allowing quick and confidential access to animations of own flights for efficient debriefings, self-training and constant self-improvement.

TODAY'S INNOVATION: THE 1ST PILOT'S APP IN THE WORLD TO REPLAY FLIGHTS ON DEMAND!

CEFA AMS (**Aviation Mobile Services**) is a cloud-based mobile service:

- which generates automatically and on demand **3D animations** of own flights
- with **highly detailed** cockpit specific avionics, external 3D aircraft and scenery views
- based on accurate and de-identified real-world flight data guaranteeing pilots' **anonymity**
- through a highly secure cloud with the highest **level of encryption**



CEFA AMS core technology is based on CEFA Aviation's experience as a leading company in flight data animation for 20 years with CEFA FAS (Flight Animation System), a software for flight investigation used by 90 airlines on 5 continents.

TESTIMONIALS

CEFA AMS is already used by the **3000 pilots of All Nippon Airways since 2017** and **Ryanair** pilots since 2019. Our launch customers give their vision:

// *ANA envisions a world where each pilot explores safety and improves their own skills. CEFA AMS could be the new style of self-training. This service contributes to the emergence of a new culture of learning and communication. //*

Hideo Morioka, Director Safety Promotion & Flight Data Analysis, **All Nippon Airways**



// *Our airline has high hopes for CEFA AMS. This flight replay facility app is a milestone in our endeavors to enhance our pilots' proficiency. It is the perfect match with our unique OFDM replay facility in our fleet of Fixed Base Simulators. //*

Captain Andy O'Shea, Head of Crew Training, **Ryanair**

// *The app will set new standards for delivering constructive feedback to our crews in a way that would have been impossible to imagine without the innovative approach to secure data processing that has been delivered by CEFA Aviation's team. //*

Captain Ray Conway, Director of Flight Standards & Chief Pilot, **Ryanair**



WORLDWIDE MEDIA COVERAGE

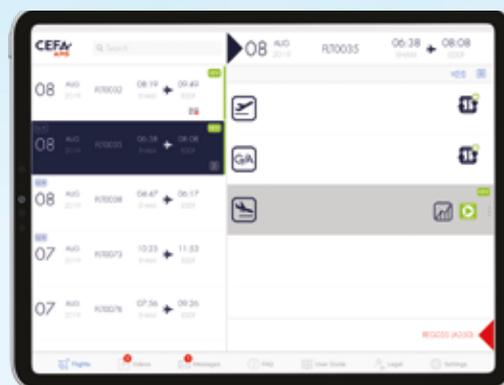
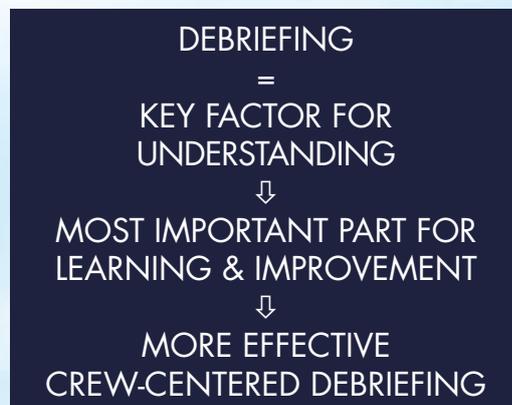
They talk about CEFA AMS (among others):

AIN | Air Journal | Air & Cosmos | Aviation Business
Arabian Aerospace | Aviation Voice | Aviation Week | BFM
BusinessTV | El Economista | FINN TV | FlightDailyNews | Italiavola
The Journal for Civil Aviation Training (CAT) | Orient Aviation



BENEFITS

- immediate & objective **debrief** within crews based on facts
- comprehensive **understanding** of flight segments, including complicated situations
- each pilot becomes his/her own **gatekeeper**
- reduction of time and costs spent in **line training**
- easy self-training & **self-reflection** tool
- **know-how sharing** (e.g. airport familiarization, best practices)
- noticeable **safety** improvements
- **costs** savings
- pilots' **experience** leveraging & accelerating
- many benefits for **novice** pilots
- refocus of Evidence-Based Training (**EBT**) to an individual level
- **harmonization** of pilots' skill levels between different airlines, subsidiaries, SOPs...



Flight list interface

USAGE & ROI

130,000 animations re-played during the 1st two years of usage

1/4 of flights replayed daily

Proven reduction of **unstabilized** approaches

95% of ANA pilots find CEFA AMS useful for performance review & safety enhancement*

*Source: ANA internal survey on 300 pilots

FEATURES

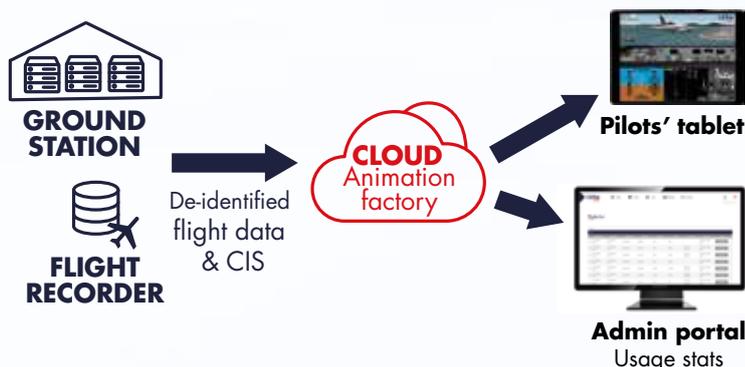
- 3D animations available on tablet app **within minutes** after reception of the recorded flight data
- possibility to replay on pilot's demand all **flight sequences of interest**: take-off, landing, go-around, customized flight segment, specific event, etc.
- very intuitive app with a convenient interface layout
- private **messaging** between involved crew members
- **weather** integrated (METAR, visibility, clouds...)
- possibility for the pilot to choose among different instrument panels and 3D view **layouts**
- integration with CEFA FAS: **CEFA AMS-E (ENHANCED) SAFETY ENVIRONMENT**
- CEFA AMS can be tailored to customer's needs

HOW DOES CEFA AMS WORK?

The data provided by the flight recorders of the airline's fleet are transferred wirelessly or manually to the company's flight data center.

Then, it is transmitted to a **secure cloud** to be processed by the CEFA AMS system with the highest level of encryption. Animations are generated automatically on pilots' demand.

They are sent to the app on pilots' tablets in a **de-identified** and secure way.



CEFA AMS system

FOR EACH PROBLEM

...WE HAVE THE SOLUTION!

FOR PILOTS

Do you want to have access to your own data and your last flights?

... With CEFA AMS, you have a confidential access to your own flights whenever wanted, on your tablet, without asking the safety department (no exposure syndrome). For the first time, each pilot becomes her/his own gatekeeper. You can learn from best practices and mishaps – your own or your colleagues’.

Do you need a tool to debrief on facts right after landing, while the crew is still together?

... The system needs a few minutes to create each flight animation as soon as the data is available in the cloud. It has never been so quick and easy to debrief with real objective & holistic facts before the eyes! CEFA AMS is like a mirror of the past.



FOR AIRLINES & FLIGHT OPERATIONS

Do you need an objective tool so that crew debriefing is based on facts?

... Instant flight data animation presents only the essential and accurate information needed for a focused debriefing, without waste of time. CEFA AMS does not present complex and unintuitive graphs, statistics and tables that are difficult to comprehend, or single values that can lead to misinterpretations and development of individual techniques.

Do you wish to save costs linked to incidents and go-arounds?

... It is proven that CEFA AMS contributes to noticeably cut down unstabilized approaches. Moreover, as the process leading to an event is easy to understand with this app, it massively reduces the risk of pilots developing individual techniques - the so-called “FDM-value flyers” (or FOQA-value). Fine tuning of flight performances avoids cost intensive troubles like tail strikes, hard landings...

FOR TRAINING DEPARTMENTS

Do you need to train many new pilots efficiently & better implement EBT?

... CEFA AMS is a self-training tool for each pilot to improve her/his skills constantly (life-long learning) by reflecting on flights in a comfortable way. This mobile service allows an efficient know-how sharing between crew members, learning from real-life situations, enriching experience: Only

animations can render the complexity and the dynamic of an event. CEFA AMS brings EBT to an individual level: Each pilot can focus on their own specific fields of improvement according to what they constantly learn about themselves.

Do you need to raise pilots’ resilience and situational awareness?

... Reviewing flights raises competences and strengthens self-confidence, both key elements of resilience. Watching animations of real-life situations – much more numerous and diverse in the real world than in a simulator session – and looking at how colleagues cope with them allows to deal better with the startle effect.

FOR SAFETY TEAMS

Do you need pilots to communicate more on incidents and events?

... Until today, many safety reports are not created by crews only because pilots are unsure about their performance. With CEFA AMS, these doubts are eliminated. It encourages pilots to report, and as such, brings a key contribution for a healthy reporting culture. Moreover, safety reports get much more precise and qualitative as they stick to the reality of the facts thanks to precise reliable animations.

Do you wish to make Safety-II principles a reality and reinforce your SMS?

... With CEFA AMS, pilots will be much keener on talking about “near incidents” – incidents that could have occurred if they hadn’t reacted in a responsive and appropriate way. With the animation, flight crews can debrief, discuss and share how they have coped in the best way to avoid a problem. CEFA AMS is a Safety-II implementation tool: It allows to use the whole envelope of reactions in order to learn out of positive and minor negative outcomes instead of focusing only on massive failures.

FOR PILOT INSTRUCTORS & NOVICE PILOTS / NEW TYPE RATING TRAINEES

Do you need a tool to debrief and support you with objective facts in your explanations, line training, check rides, type ratings and qualifications?

... With facts shown in a format easy to understand, debriefs and flight instruction are based on holistic factual evidences, which means a more qualitative dialog between trainee and instructor. Trainees can even reflect on their performance by themselves which is the best way to learn.

Do you need a tool for a more precise instruction?

... Novice pilots can replay CEFA AMS animations at home, confronting them with what was said during debriefing. This way, they can base future corrections on factual values and concrete figures instead of subjective perceptions. For instance, when the instructor says “you had a bit of a long landing”, CEFA AMS allows to set a concrete gate for future flights.

KEY FIGURES

20 years experience

40% of turnover invested in **R&D**

90 airlines as clients

15 millions of flights analyzed by all CEFA Aviation's software users, giving a unique **reliability**

30+ different cockpits types

ABOUT US

CEFA Aviation, a privately held French company, enhances pilot training and flight safety, developing **world-leading 3D animation software** and services for the past 20 years.

The innovative solutions developed by its experts recreate flights with high detail and accuracy based on data from aircraft flight recorders.

90 major and regional airlines, cargo operators and investigative authorities on five continents are using the core software of the company, **CEFA FAS** (Flight Animation System) for pilot training and safety analysis.

Translating flight data into precise visualization requires in-depth understanding of the complexity of aircraft systems and software engineering.

CEFA Aviation has been a pioneer in **easy-to-use flight data animation** since Dominique Mineo founded the company in 2000. Its long-lasting success is attributable to a passion for aviation and innovation, listening to its clients, and delivering gold-standard support.

The CEFA Aviation team is headquartered in Alsace, a region in Eastern France.

#ForASaferSky #FlightDataAnimation #FlightSafety #PilotTraining #innovation



DID YOU KNOW?

Thanks to CEFA AMS, ANA was awarded an **innovation prize** by the Ministry of Economy & Tokyo Stock Exchange in May 2018!

Request a demo now!

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