

'The Augmented Approaches to Land project aims to show the complementarities between several approach solutions into different operational environments. It will demonstrate that augmented vision and satellite-based augmented navigation can improve access while reducing the environmental impact of all types of Airspace Users into all types of airports', said Jean-Philippe Ramu, a pilot for NetJets Europe. 'I am proud to see such a large consortium believing in shared improvements. It would not have been possible without the framework set by the SESAR Joint Undertaking. We believe that the project will show what will be the approach and landing operations of tomorrow.'

'These latest demonstration projects are a fantastic opportunity to showcase innovations emerging from the SESAR Research and Innovation (R&I) Programme on a large scale and in real operational conditions', said Florian Guillermet, Executive Director, SESAR JU. 'I am delighted to see so many stakeholders from around Europe taking part; with their support, I am confident that these projects will further convince the broader community that the first SESAR solutions are now fit for wider scale deployment.'



Established in 2007, the SESAR Joint Undertaking is one of the European Union's most successful public-private partnerships, whereby the entire European Air Traffic Management (ATM) sector engages in a single European effort to overcome the past fragmented approach to ATM. As the technological pillar of the Single European Sky (SES), the SESAR Programme has a critical role to play in developing the necessary technologies and operational procedures to make European air travel more cost efficient, environmentally friendly, and even safer.

"SEEING IS BELIEVING"



AUGMENTED APPROACHES TO LAND



CALL & VISIT

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LARGE SCALE DEMONSTRATION PROJECT

200 DEMONSTRATION FLIGHTS, 15 PARTNERS, 7 AIRPORTS, 6 AIRCRAFT TYPES, 5 TECHNOLOGIES

1 OBJECTIVE

Provide Shared Approach & Landing Benefits

A 15-company-strong consortium, named Advanced Approaches for all Airports (A3) and led by NetJets Europe, has been formed under the Single European Sky Air Traffic Management Research (SESAR) programme to demonstrate new approach and landing solutions that will increase the capacity of the European airport network whilst reducing environmental impact.

The A3 consortium will implement the Augmented Approaches to Land project (AAL), co-financed by the SESAR Joint Undertaking. This project will perform over 200 demonstration flights by 2016 to validate new approach and landing technologies on a significant number of aircraft types and in an extensive range of airport environments.

The AAL project aims to develop and demonstrate the feasibility of several advanced augmented approach procedures at all types of airports, based on the following five technologies:

- Curved Required Navigation Performance (RNP) legs
- Ground-Based Augmentation Systems (GBAS)
- Satellite-Based Augmentation Systems (SBAS)
- Synthetic Vision Guidance System (SVGS)
- Enhanced Flight Vision System (EFVS)

The project will pave the way for the uptake of these technologies, needed to overcome limitations of the current Instrument Landing System (ILS) – equipment which is costly to install and maintain, and which does not offer the flexibility to optimise the flight path for fuel efficiency and noise abatement.

Small and large airport operators, key business and commercial aviation stakeholders, and Air Navigation Service Providers (ANSPs) will contribute to the project in order to validate expected benefits, including noise abatement, reduced emissions, lower fuel consumption, and alleviated airport and airspace traffic.

BENEFITS

The use of advanced satellite and ground-based approach procedures (including curved paths and increased glideslopes) will explore new opportunities for accessing large hubs, as well as small airports in the vicinity of metropolitan areas, whilst proving reduced impact on the environment and population. In addition, to meet passenger expectations and decrease disturbances at European airports during high-traffic periods, the consortium will apply enhanced and synthetic vision technologies to increase access for business aviation into small and regional airports in marginal weather conditions.

EXPECTED BENEFITS INCLUDE:

- **Access:** by providing solutions for access into small airports in poor weather conditions
- **Sound emissions:** by supporting the design of approach procedures that reduce the impact on the population
- **Fuel efficiency:** through better predictability and accuracy of navigation that will optimise the flight path and support continuous descent operations
- **Capacity:** by avoiding diversions at small airports and supporting the redesign of more effective arrival procedures in complex terminal airspaces
- **Safety:** by streamlining approach and landing operations, whilst enhancing pilot situational awareness

PARTNERS

Airspace users of business and commercial aviation will be represented by NetJets Europe, the European Business Aviation Association (EBAA), Lufthansa and Swiss.

NETJETS



Avionics will be supplied and tested by Honeywell Aerospace and Elbit Systems.



Procedural design will be led by DFS, ANS CR and Skyguide with the support from DLR and Airbus ProSky. DSNAA will provide airport operational procedures study.



Airframe manufacturer and aircraft systems knowledge will be provided by Dassault Aviation and Airbus.



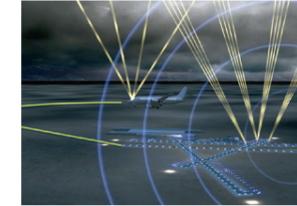
The airports in Frankfurt and Zurich will also contribute to the consortium.



TECHNOLOGIES

During the AAL project, the supporting technologies under development will be demonstrated and validated in conjunction with new airport procedures. This project will rapidly generate solutions, speed up deployment, and contribute to the goal of Air Traffic Management (ATM) modernisation.

CURVED NOISE ABATEMENT PROCEDURES



Curved noise abatement RNP legs with transition to either augmented approach systems (GBAS and SBAS) or to a conventional ILS approach. For further benefits, the demonstrated approaches will optionally be combined with an increased glideslope of 3.2°.

SATELLITE- AND GROUND-BASED AUGMENTED APPROACHES



SYNTHETIC VISION GUIDANCE SYSTEM



Synthetic Vision Guidance and Enhanced Flight Vision Systems (SVGS and EFVS) enable lower decision heights and reduced runway visual range, and providing increased accessibility to the airport in low-visibility conditions.

ENHANCED FLIGHT VISION SYSTEM



ELECTRONIC FLIGHT BAG



The project also includes flight planning and information access via portable devices in the cockpit, which is of particular interest to airspace users not supported by a Flight Operations Centre (FOC), as is the case for many business aviation operators.



DEMONSTRATIONS

Flight trials of curved noise abatement RNP legs with transition to GBAS or to a conventional ILS will be carried out by a variety of aircraft types from three different operators. More than 130 flight trials will be executed. These demonstrations will take place at Frankfurt, Bremen, and Zurich airports.

FRANKFURT AIRPORT



ZURICH AIRPORT



GBAS GROUND STATION



AIRBUS A380 OPERATED BY LUFTHANSA



AIRBUS A320 OPERATED BY SWISS



FALCON 900 AS HONEYWELL FLIGHT TEST AIRCRAFT



Demonstrations of SVGS and EFVS will be executed by Honeywell and Dassault Aviation flight test aircrafts respectively. In total, up to 80 flight trials are expected in Czech Republic (Ostrava) and France (Perigueux, Bergerac and Bordeaux).

OSTRAVA AIRPORT (CREATED BY KANIA A.S.)



BORDEAUX AIRPORT



FALCON 900 AS HONEYWELL FLIGHT TEST AIRCRAFT



FALCON 7X AS DASSAULT AVIATION FLIGHT TEST AIRCRAFT

