



# AVIATION SOFTWARE STANDARDS APPLIED TO ATM

With airborne and ground-based aviation systems increasingly interconnected, the landscape for critical systems software is changing. Civil aviation is a sector where critical software components (both air and ground sectors) are increasingly present. Furthermore, new technologies such as e-enabled aircraft, computer-based concepts and new technologies and concepts such as A-SMGCS, APW, ADS-B and drones have changed the safety risk landscape of the aviation system. At the same time, there is growing demand for guidance and clarification on the way some principles and methodologies are integrated in the lifecycle of critical aviation software systems and components.

Whether you are an ANSP specifying or accepting a system, the person responsible for system maintenance, or a supplier at the cutting edge of software product development, you will need to understand the standards options available to you, how to apply them, and the impact on costs.

This course takes a practical and interactive approach to the subject matter, drawing on the trainers' extensive experience in both aviation safety and critical systems software development. Attendees will receive complimentary copies of ED-12C, ED-109A and ED-153.

## Who should attend?

ANSPs: safety & quality managers, technical department heads, maintenance managers.  
Systems Manufacturers and Software Tools Providers: product assurance managers, quality managers, conformity managers, compliance managers, product development managers, technical department managers. Aviation software developers from around the world.

## Course content

- ▶ **Aviation software context and standards landscape**
- ▶ **Software development processes common to ED-12C, ED-109A & ED-153**
- ▶ **Software safety in airborne systems: ED-12C**
- ▶ **Software safety in ATM/CNS systems: ED-109A**
- ▶ **Software safety in ATM/CNS systems: ED-153.**

## Learning objectives

The purpose of the training is to enable participants to have an overview of the most relevant EUROCAE standards to apply for systems and software development in aviation. Having completed the training participants should be able to:

- ▶ Identify the principles and consequences of good software engineering practices in the aviation domain.
- ▶ Describe how software safety regulations, standards and certification affects the different actors in aviation.
- ▶ Understand how standards can help them manage software development costs in safety critical systems.
- ▶ Explain the scope and content of ED-12C, ED-109A and ED-153 as applicable to them.
- ▶ Identify key differences and similarities between the different standards by mapping the links between them
- ▶ Select an appropriate standard, or set of standards, to adopt for specific aviation software safety purposes.
- ▶ Outline the key requirements underpinning software systems approval.

## Benefits of attending

- ▶ Participants will understand which standard to use for what purpose and at what cost implications.
- ▶ EDs for Aviation Software brought to life with classroom scenarios and exercises.
- ▶ Instructors are senior advisers on aviation software and experienced trainers.
- ▶ Sharing experiences with colleagues from other aviation stakeholders/countries.
- ▶ Extensive course handouts including ED-12C, ED-109A and ED153.
- ▶ Certificate on completion of the course
- ▶ Ideal learning environment at EUROCAE HQ in Saint-Denis (Paris area, France).

## Course Format

The training will be led by experienced aviation software experts. It takes place over two days and will be interactive, including small group exercises to facilitate learning and

enjoyment. Colour handouts will be provided, as well as a soft copy on memory stick, and complimentary copies of the ED standards.

<b>DAY ONE</b>	
<b>1 - Introduction</b>	9:00 - 9:30
<b>2 - The aviation software safety context and standards landscape</b> <ul style="list-style-type: none"> <li>• Critical software characteristics</li> <li>• Airborne software / ground software: similarities and differences</li> <li>• SW safety management frameworks               <ul style="list-style-type: none"> <li>➢ SES and European regulation</li> <li>➢ EASA AMCs</li> <li>➢ FAA</li> </ul> </li> </ul>	9:30 - 10:45
<b>Refreshment break</b>	10:45 - 11:00
<b>2 - The aviation software safety context and standards landscape (continued)</b> <ul style="list-style-type: none"> <li>• SW standards               <ul style="list-style-type: none"> <li>➢ EUROCAE</li> <li>➢ RTCA</li> <li>➢ IEEE</li> <li>➢ ISO</li> <li>➢ SEI (CMMI)</li> </ul> </li> </ul>	11:00 - 12:00
<b>Lunch break</b>	12:00 - 13:00
<b>3 - Software development processes common to ED-12C, ED-109A &amp; ED-153</b> <ul style="list-style-type: none"> <li>• System/Software safety assessment</li> <li>• Development Assurance Level/Software Assurance Level</li> <li>• Development processes               <ul style="list-style-type: none"> <li>➢ Development processes</li> <li>➢ Software planning</li> <li>➢ Software development</li> <li>➢ Software verification</li> <li>➢ Supporting processes (quality, configuration management)</li> <li>➢ Software certification/qualification</li> </ul> </li> </ul>	13:00 - 14:45
<b>Refreshment break</b>	14:45 - 15:00
<b>3 - Software development processes common to ED-12C, ED-109A &amp; ED-153 (continued)</b> <ul style="list-style-type: none"> <li>• Conformity demonstration: traceability, coverage, evidences, certification/ approval</li> <li>• Additional aspects: COTS, reused software, tools qualification</li> <li>• Development costs</li> </ul>	15:00 - 17:30

<b>DAY TWO</b>	
<b>3 - Software development processes common to ED-12C, ED-109A &amp; ED-153 (continued)</b>	9:00 - 10:30
<b>Refreshment break</b>	10:30 - 10:45
<b>4 - SW safety in airborne systems: ED-12C</b> <ul style="list-style-type: none"> <li>• ED-12C: specificities</li> <li>• Airborne software</li> <li>• New concepts introduced by the new release (2012)</li> <li>• ED-215, ED-216, ED-217, ED-218</li> <li>• ED-80</li> <li>• ARP4754: system/component model and safety flows</li> </ul>	10:45 - 12:30
<b>Lunch break</b>	12:30 - 13:30
<b>5 - SW safety in ATM/CNS systems: ED-109A</b> <ul style="list-style-type: none"> <li>• ED-109A: specificities</li> <li>• CNS/ATM Software</li> <li>• Adaptation Data (Parameter Data Items)</li> <li>• COTS</li> <li>• Service history</li> </ul>	13:30 - 14:30
<b>6 SW safety in ATM/CNS systems: ED-153</b> <ul style="list-style-type: none"> <li>• ED-153: specificities</li> <li>• Complementarity with ED-109A</li> </ul>	14:30 - 15:00
<b>Refreshment break</b>	15:00 - 15:15
<b>6 SW safety in ATM/CNS systems: ED-153 (continued)</b> <ul style="list-style-type: none"> <li>• EUROCONTROL SAM</li> <li>• Software Safety Assurance Level (SWAL) in the System safety Assessment process</li> <li>• Interoperability</li> <li>• Primary lifecycle processes (Acquisition, supply, operation, maintenance)</li> </ul>	15:15 - 16:15
<b>7 Round-up and assessment</b>	16:15 - 17:00

### Lead instructor



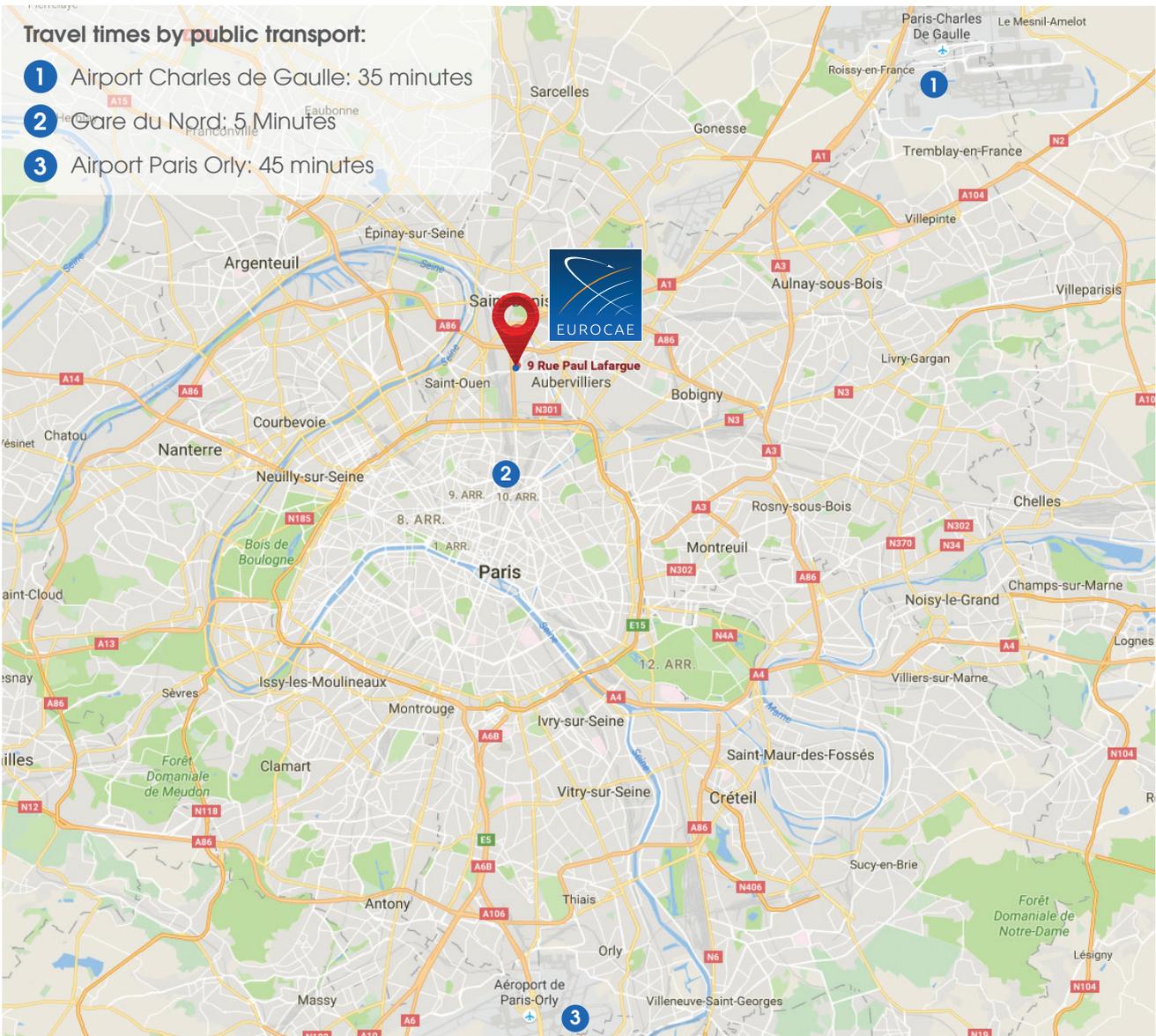
Alberto Arazo has more than 30 years in engineering and consulting in the development of safety critical systems in the nuclear and transportation sectors. His PhD focused on innovative techniques aiming

at validating and verifying critical software systems. He joined Egis in 2002 and has been a key Egis/ HELIOS expert in this area. Alberto has supported aviation institutions (EUROCONTROL and European Commission), ANSPs (DSNA, Croatia Control and AVINOR) and the Industry (Thales Alenia Space, Thales ATM and ADACEL) in the management of safety of software systems.

## Location

The training takes place at EUROCAE headquarters in Saint Denis, Paris area. The offices are conveniently located 5 minutes' train ride from Gare du Nord, and 35 minutes by car/rail from Paris Charles de Gaulle (CDG) Airport.

- ▶ Located directly at the RER B station La Plaine, Stade de France.



## Course Fees

EUR 1.199 excl. VAT / EUROCAE members  
EUR 1.499 excl. VAT / non-EUROCAE members

Fee includes all training, refreshments and handouts. Note that overnight accommodation is not included, however we are happy to recommend two local hotels within easy reach/walking distance of the offices.

## How to book

Places are limited to a maximum of 20 people, so you are advised to book early online here:

<https://eshop.eurocae.net/trainings-and-other-events>

For any additional information please contact Adrian Cioranu, Director, Training and Communications, Technical Programme Manager at [Adrian.Cioranu@eurocae.net](mailto:Adrian.Cioranu@eurocae.net).

### Terms and Conditions

Course Fees: Standard fees for the training course are € 1.199 / € 1.499, excluding VAT. VAT is charged at standard French rate. Please contact us for more details. Fees include refreshments, lunch and course documentation. All course fees must be paid by the due date stated on the invoice. All bookings are provisional and will only be confirmed once payment has been received.

EUROCAE reserves the right to reallocate places if full payment has not been received. Delegates are responsible for organisation and payment of overnight accommodation and any other expenses incurred (eg. travel to/from the venue.)

Cancellations: Cancellations received in writing up to 14 days before the start of the event will be refunded in full less an administrative charge of 10% (+ VAT where relevant). We are unable to refund cancellations received 14 days or fewer prior to the start of a course. However, in such cases and at the organisers' discretion, a place may be offered at a later course. Delegate substitutions may be made at any time, though confirmation of any changes must be received by email or post prior to the start of a course.

Non-attendance: In the event of non-attendance, full course fees will remain payable and no refunds will be made. Changes to Programme or Venue: The organisers reserve the right to make changes to or cancel a published course due in part or in full to unforeseen circumstances or insufficient numbers. In such circumstances, all reasonable efforts will be made to notify delegates of any necessary changes in good time and if necessary to reschedule or to relocate the course. Delegates will be entitled to a refund of the course fee if the course is cancelled or is changed to a date or location which is not acceptable to the delegate. The organisers will have no liability to delegates for damages of any nature arising from the cancellation of a course or from a change in its date, its location or its speakers.