

TERMS OF REFERENCE
Special Committee (SC) 240
Aviation Software Standards
(Revision 4)

ORIGINAL REQUESTORS:

This committee is being established at the request of EUROCAE for RTCA to form a joint committee.

Organization	Person
XXXX	XXXX

SC LEADERSHIP:

Position	Name	Affiliation	Telephone	email	
Chair	Russ Uthe	Collins Aerospace	+1 319 295 5497	russ.uthe@collins.com	
Chair	Patty Bath	Belcan	920-366-8106	pbath@belcan.com	New
GAR	Mike Vukas	Federal Aviation Administration (FAA)	816.329.4133	mike.vukas@faa.gov	
Secretary	Andy Hoag	Aireon LLC	571.401.1405	andrew.hoag@aireon.com	

BACKGROUND:

On March 30, 2019, RTCA and EUROCAE sent a joint request to the Forum for Aeronautical Software (FAS) to consider if the software standards developed by RTCA and EUROCAE were fit for purpose for use when developing software for unmanned aviation systems.

The FAS formed an Ad Hoc with members of EUROCAE WG-105 and RTCA SC-228 (Note these joint activities) to investigate the constraints that developers of UAS face when trying to use DO-178C/ED-12C and the supplemental standards as part of their software development process. The output of this report was a white paper (RTCA Paper No: 054-19/PMC-1859(1)) which was presented to the PMC at their March meeting in 2019.

The FAS White Paper divided the issues identified by the UAS community into three groups:

- Further information needed from outside the FAS
- Create a FAS Topic Paper concerning the issue
- Supplemental information needed for both UAS and other software developers.

September 21, 2023

The PMC requested that the FAS, with input from the Ad Hoc, develop outlines for the topics identified where additional information and guidance were needed. These outlines are about how to use Service History when employing DO-178C (RTCA Paper No 049-20/PMC-1988) and how to use COTS or Open Source when employing DO-178C (RTCA Paper No 050-20/PMC-1989).

EUROCAE has established Working Group 117 to produce technically equivalent documentation.

In addition, now that the scope of SC-240 is focused only on a Supplement for use with DO-178C and DO-278A, the RTCA secretariate has decided the time is right to combine SC-240 with the FAS. This aligns with the decision by EUROCAE to combine the FAS with WG-117.

DELIVERABLES:

Product	Description ‡	FRAC Completion Due Date*	Change
DO-YYY	Incorporation of Commercial Off the Shelf Software and/or Open Source Software Supplement to DO-178C/ED- 12C and DO-278A/ED-109A	6/2024	10/2022
RR-ZZZ	Report on Plans for Deliverables and Future Work for the Development of Aviation Software Standards	10/2024	New
RR-YYY	Report on Product Service History	6/2025	New
DO-YYYA	Incorporation of Commercial Off the Shelf Software and/or Open Source Software Supplement to DO-178C/ED- 12C and DO-278A/ED-109A	6/2027	10/2023

‡Note: Document descriptions are included here for reference. Final document titles will be coordinated with TAC/PMC.

*Note: Final Review and Comment (FRAC) Completion Due Date refers to the date that the committee plenary approves the document after completing the FRAC Process. SCs should submit

the final document at least 45 days before the PMC meeting where it will be considered for approval.

SCOPE and COORDINATION:

This committee will work jointly with EUROCAE WG-117 and all documents produced will be published both by EUROCAE and RTCA as technically equivalent documents.

Incorporation of Commercial Off the Shelf Software and/or Open Source Software:

This document should incorporate the outlines provided by the FAS referenced above to provide additional information and insights on how the existing documents allow for the incorporation of commercial off-the-shelf (COTS) and/or Open Source Software into the creation and verification of software for airborne systems or CNS/ATM Systems. This document is expected to function as additional clarification for development of software to incorporate and use COTS and/or Open Source Software following DO-178C/ED-12C or DO-278A/ED-109A. The information in this document is intended to inform and clarify. It is expected to be compatible with DO/ED document addressing this topic.

The committee will discuss the relationship of this document to security standards and requirements and bring it to the attention of the PMC if the committee feels it should be added to the scope of this document. If content of this document is required to supersede an existing publication, the committee is expected to bring the issue before the PMC before proceeding. This coordination may be done as an off-cycle communication with the PMC and handled by the PMC secretary.

In order to facilitate an earlier release, the committee will plan two releases of this document.

The first release will include:

DO-178C/ED-12C COTS and OSS¹ for Level C and Level D

ED-109A/DO-278A COTS and OSS for AL²₃, AL₄, and AL₅

The second release will revise the document and add:

DO-178C/ED-12C COTS and OSS for Level A and Level B

ED-109A/DO-278A COTS and OSS for AL₁ and AL₂

Report on Plans for Deliverables and Future Work

An additional task the committee should take on once the FAS is merged with SC-240 is to develop a report, RR-ZZZ, that defines what publications the joint committee believes are appropriate at this time. RR-ZZZ should include the reasoning behind proposed updates to support a Terms of Reference (ToR) which will reflect the deliverables. When completing the initial report, it should address the expected use of any future deliverables within the regulatory context (e.g. references to the revised or new deliverables) for consideration by the regulatory authorities. Taking into account the essential nature of the software process documents for the aeronautical community, RR-ZZZ should be published as a RTCA Report (RR) and updated regularly. In addition, RR-ZZZ could be submitted to Final Review and Comment (FRAC) to ensure full transparency and allow the views of all interested parties to be reflected. The committee should inform the PMC on whether public commenting will be used.

¹ Open Source Software

² AL is Assurance Level as defined in DO-278A/ED-109A

Report on Product Service History

The committee spent time while creating the supplement for incorporation of COTS and Open Source Software on the topic of service history and how to determine equivalency of safety. A report will be created to share information on service history in areas that did and did not have consensus. Areas that did not have consensus will discuss what information would be needed to get to consensus.

ENVISIONED USE OF DELIVERABLE(S)

Incorporation of Commercial Off the Shelf Software and/or Open Source Software:

This document is expected to function as additional consideration for the development of software to incorporate and use COTS and/or Open Source software following either DO-178C/ED-12C or DO-278A/ED-109A.

Report on Plans for Deliverables and Future Work

This document will be of use to the PMC and RTCA in determining the need for modifications of existing software process standards published by RTCA and EUROCAE, the creation of new standards and reports for software standards and evaluating the need for documents while coordinating with EUROCAE.

Report on Product Service History

This document is expected to be of use for the development of software that intends to apply service history for certification credit. This document will be of use to the PMC and RTCA in determining the need for product service history modifications of existing standards published by RTCA and EUROCAE, or the creation of a new standard.

SPECIFIC GUIDANCE:

The documentation below is to be considered by the committee for deliverables. Any contradictions between the deliverables and the documents in the first line of the following table should be identified to the PMC as early as possible in the process.

Document	Intended Use
<p>DO-178C/ED-12C Software Considerations in Airborne Systems and Equipment Certification</p> <p>DO-278A/ED-109A Software Integrity Assurance Considerations for Communication, Navigation, Surveillance and Air Traffic Management (CNS/ATM) Systems</p> <p>DO-248C/ED-94C Supporting Information for DO-178C/ED-12C and DO-278A/ED-109A</p> <p>DO-330/ED-215 Software Tool Qualification Considerations</p>	<p>These documents should be used as reference and any document produced by this committee should not require changes by previously completed or currently in process development activities.</p>

DO-331/ED-218 Model-Based development and verification supplement to DO-178C/ED-12C and DO-278A/ED-109A DO-332/ED-217 Object-Oriented Technology and Related Techniques Supplement to DO-178C/ED-12C and DO-278A/ED-109A DO-333/ED-216 Formal Methods supplement to DO-178C/ED-12C and DO-278A/ED-109A	
FAS documentation including FAS Topic Papers, FAS UAS Ad Hoc Report and outlines for supplemental guidance	

TERMINATION: When the scope of this Terms of Reference is complete, the committee will recommend either that the committee Sunset, going into Active Monitoring Mode, or spend a period of time in Hiatus. Any change/extension in the committee’s work program requires prior PMC approval.