



# Certification Memorandum CM-ES-004

## Acceptable methods for aircraft EMC demonstration

Mauro PAGLIARINI  
Electrical Systems Expert

**PART 21 WORKSHOP**  
November 26<sup>th</sup> 2024

**Your safety is our mission.**

An Agency of the European Union 

# CM-ES-004

## *Acceptable Methods for Aircraft EMC Demonstration*

- Date of issue (01):  
26 June 2024
  
- Purpose of the CM:  
to provide guidance on acceptable methods for demonstrating inter-systems Electromagnetic Compatibility (EMC) on aircraft.
  
- Intent of EMC demonstration:  
to show that the aircraft electrical and electronic systems required for safe operations are not adversely affected by electromagnetic interference (EMI) that can be generated by the simultaneous operation of any other aircraft systems.
  
- Applicable requirements:  
Certification Specifications paragraphs referenced in the CM, among them (but not limited to):  
CS 2x.1309(a), 25.1353(a), CS 25.1431(c), CS 29.1353(a), CS 29.1431(b), CS 23.2500(b), CS 23.2510(b).
  
- Addressees:  
the guidance is mainly addressed to applicants for a new aircraft TC, a change of a TC, or a STC. Applicants for ETSO authorization can also benefit of guidance related to equipment qualification as contributor of the EMC compliance process.

# CM-ES-004

## *Acceptable Methods for Aircraft EMC Demonstration*

- recognises the standard EUROCAE ED-248 „GUIDE TO CIVIL AIRCRAFT ELECTROMAGNETIC COMPATIBILITY (EMC)“ as an acceptable guidance to conduct an EMC demonstration at aircraft level (see following slide);
- highlights salient points that are addressed by the standard (see following slide);
- references further guidance for specific applications (e.g. AMC to specific CS requirements, RTCA DO-313 for non essential cabin systems).

# EUROCAE ED-248

## *Guide to Civil Aircraft Electromagnetic Compatibility (EMC)*

- Technically identical to SAE ARP60493.
- It provides standard approaches and methods for achieving aircraft EMC in civil aviation.
- Prior the publication of ED-248, or in alternative to its use, EMC demonstration strategies could have been proposed and agreed on a case-by case basis, often based on:
  - existing general guidelines about potential sources of interference, not providing detailed guidance about acceptable methods to assess their effects;
  - EMC sections of standards dedicated to specific applications, where pertinent;
  - methods, techniques and practices that became consolidated over the time, adapted to the single project;
- Added values of this standard:
  - common and consistent approach for EMC demonstration and assessment of results across the applications;
  - methods that apply a level of rigor commensurate to the complexity of the application;

# EUROCAE ED-248

## *Guide to Civil Aircraft Electromagnetic Compatibility (EMC)*

- provides information and background related to EMC concepts, applicable requirements and compliance process;
- provides guidance on EMC demonstration at aircraft level;
- provides guidance on EMC equipment qualification in support of the demonstration at aircraft level;
- provides criteria to determine the level of complexity of an application and description of the acceptable demonstration methods accordingly:
  - complex projects (new aircraft, complex modifications, modifications with potential impacts on highly integrated systems that are safety critical) require a thorough assessment that typically includes extensive testing activity on the aircraft;
  - simple modifications, for which a more limited demonstration activity may be sufficiently adequate to show compliance, e.g. based on equipment qualification data and assessment of the installation environment.

# CM-ES-004

## *Further guidance*

- The CM reference also to further guidance that address EMC in general terms, without providing details on specific acceptable methods, e.g. AMC 25.1353(a).
- Standards that may provide further guidance for specific applications, e.g. RTCA DO-313 for non essential cabin systems, which contains sections dedicated to the EMC.

# CM-ES-004

*Link to the EASA website*

→ Title:

*Acceptable Methods for Aircraft EMC Demonstration*

→ Issue: 01

→ Date of issue:

26 June 2024

→ Link to the document:

<https://www.easa.europa.eu/en/downloads/140039/en>

# Questions?





**Thank you  
for your attention.**

[easa.europa.eu/connect](https://easa.europa.eu/connect)



**Your safety is our mission.**

An Agency of the European Union 