



EUROPEAN AVIATION SAFETY AGENCY  
AGENCE EUROPÉENNE DE LA SÉCURITÉ AÉRIENNE  
EUROPÄISCHE AGENTUR FÜR FLUGSICHERHEIT

# Electronic Flight Bag Workshop with RAG-SSCC

## Draft AMC 20-25

Romuald SALGUES – Airbus

**AeroS**pace and **D**efence industries association (ASD) representative  
Member of the Review group

18 April 2013

Your safety is our mission.  
[easa.europa.eu](http://easa.europa.eu)



# Objective of the presentation

- **To point out changes between :**
  - **Draft AMC 20-25 (v1)**  
released for public consultation in March 2012 (NPA 2012-02)  
- and -
  - **New draft AMC 20-25 (v6.1)**  
resulting from the 3 meetings of the comments review group
  - **Note : Most important changes from TGL 36 will be highlighted as well**

- 1st Part :
  - Purpose and scope
  - Reference documents
  - Glossary
  - System description and classification
    - Hardware
    - Software
  - Hardware and software processes
    - Hardware airworthiness approval
    - Certification documentation

## ➤ 1st Part :

### ➤ Appendixes :

- A: Examples of Type A Software Applications
- B: Examples of Type B Software Applications
- C: Process for the Classification of Software Applications
- J: Power Supply Considerations for Portable EFBs
- K: Considerations for Rapid Depressurisation Test

- 2nd Part : presented by Paul Edwards
  - Operational assessment (§6.2 + §7)
  - Appendixes :
    - D : Human Machine Interface Assessment and Human Factors Considerations
    - E : Flight Crew training
    - F : Software application documentation
    - G : EFB Policy And Procedures Manual
    - H : Airport Moving Map Display (AMMD) Application With Own-ship Position
    - I : Example of final operational report



# AMC 20-25 : Purpose and scope (§1)

## ➤ **Purpose of AMC:** New wording

- “Acceptable Means of Compliance to obtain airworthiness **approval** and **to satisfactorily assess the operational aspects** for the use of EFBs”

## ➤ **Change :**

« OPS approval » removed

## ➤ **Reasons for Change :**

- EASA not mentioned anymore (liability)
- No more distinction between OPS evaluation by EASA and OPS approval process by NAA
- Formal approval processes can NOT be introduced by AMC

## ➤ **Result:** unique OPS assessment description





# AMC 20-25 : Purpose and scope (§1)

## ► Type C S/W application removed



## ► Reasons for Change :

- Harmonisation with FAA
- Non-Type A or Non-Type B or « Non-Miscellaneous » are certified avionics functions



# AMC 20-25 : Reference Documents (§3)

- EU-OPS → Reg. 965/2012 (Part-ORO and Part-CAT)
- **REFERENCES ADDED :**
  - 3 CS-25 §§ : 25.561 + 25.777 + 25.789 (retention of mass + cockpit controls)
  - 3 AMCs : 25.1309 (safety) + 25-11 (Displays) + CS-MMEL
  - 2 ED : ED-76 (databases) + ED-80 (H/W assurance)
  - 3 DO : DO-200 (databases) + DO-254 (H/W assurance) + DO-311 (Li batteries)
  - 1 AC : AC 120-78 (Electronic signature)



## ➤ **Terms Removed :**

- pre-composed information

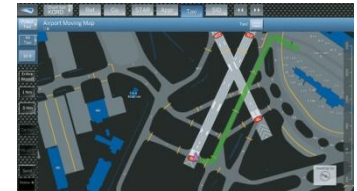
## ➤ **Terms modified:**

- Electronic Flight Bag (EFB) : for consistency with recommended ICAO definition (March 2013)
- Data Connectivity for EFB Systems :  
Direct interconnectivity between EFBs or between EFBs and ground systems not covered



## ➤ **TERMS ADDED :**

- Airport Moving Map Display (AMMD)
- Consumer Device
- EFB Host Platform
- EFB Host Platform Developer
- EFB Risk Assessment and Mitigation
- Software Application Developer
- Transmitting PED (T-PED)





## ➤ **TERMS ADDED :**

### ➤ **Viewable Stowage**

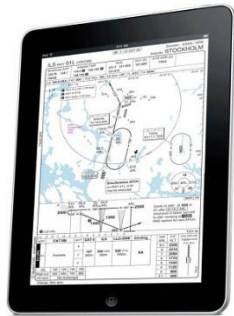
A device (e.g. suction cups) that is secured in/to an existing aircraft part or secured on the flight crew (e.g. kneeboard) with the intended function to hold charts or to hold acceptable light mass (for example no more than 1 Kg) portable devices (e.g. EFB) viewable to the pilot.

**The device is not necessarily part of the certified aircraft configuration**



## ► **New EFB H/W definition (§5.1):**

- Class 1 + Class 2 H/W → “PORTABLE” EFB



- Class 3 H/W → “INSTALLED” EFB





# HARDWARE definition (§5.1)

## ➤ **PORTABLE EFB (§5.1.1) :**



### ➤ **DEFINITION :**

“A portable EFB is a portable EFB host platform, used on the flight deck, which is not part of the certified aircraft configuration”



# HARDWARE definition (§5.1)

## ➤ **PORTABLE EFB (§5.1.1) :**

### ➤ **Main complementary characteristics:**

- Controlled PED
- PED as defined in GM1 CAT.GEN.MPA.140
- can be operated inside and outside of the aircraft
- mass, dimensions, shape and position of the portable EFB should not compromise flight safety
- easily removable without use of tools by the flight crew (if not accessible or not removable => to be certified)
- may be part of a system containing EFB installed resources
- may be used in all phases of flight if secured to a certified mount or securely attached to a viewable stowage device (otherwise: stowed)
- ...



# HARDWARE definition (§5.1)

## ➤ **INSTALLED EFB (§5.1.2):**

- **DEF.** : “An EFB Host Platform installed in the aircraft and considered as an aircraft part, thus covered by the aircraft airworthiness approval”
- **Complementary characteristics:**
  - No changes vs. prior Class 3



Installed EFB  
platform



Installed EFB  
resource (display)



## SOFTWARE definition (§5.2)

### ► **Type A (§5.2.1):**

- No change from Draft v1 but significant change from TGL 36

- **DEF.** : “EFB applications whose malfunction or misuse have no safety effect ”

*(≠TGL 36 : precomposed, fixed presentation of data)*

### ► **Complementary characteristics:**

- Do not require any approval  
*(≠ TGL 36 : OPS approval required)*



# SOFTWARE definition (§5.2)

## ➤ **Type B (§5.2.2):**

- Minor change from Draft v1 but significant change from TGL 36

- **DEF.** : “Whose malfunction or misuse are limited to a minor failure condition”

*(≠ TGL 36 : dynamic, interactive applications)*

## ➤ **Complementary characteristics:**

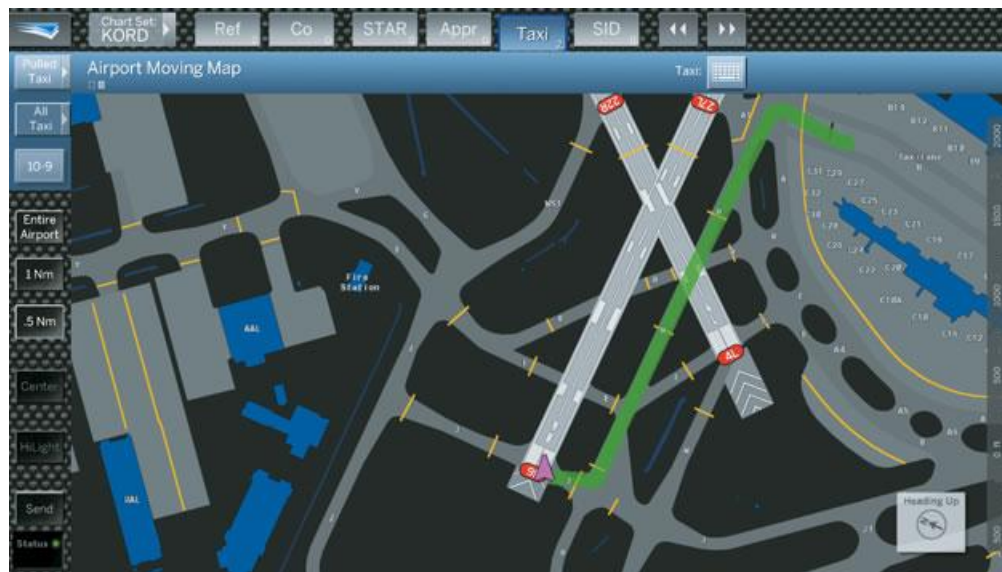
- Require an operational **assessment**  
*(≠ AMC v1: Require an operational **approval**)*



# SOFTWARE definition (§5.2)

## ► **Airport Moving Map Display (AMMD) Application with Own-Ship Position (§5.2.2.1):**

- Classification changed from Type C to Type B (see presentation about Appendix H)





## SOFTWARE definition (§5.2)

- **“Type C”** superseded by **“Miscellaneous (non-EFB) Software Applications”** (§5.2.3):

- **DEF.** : *“non-EFB applications, supporting function(s) not directly related to operations conducted by crew on the aircraft”*



- Paragraph 6 fully rearranged :
  - V1 : EFB H/W approval process (§6.1)  
and EFB S/W approval process (§6.2)
  - V6.1 : Airworthiness approval process (§6.1)  
and Operational assessment (§6.2)
  
- Main consequence :
  - Portable H/W assessment\*, moved and mixed  
with S/W assessment in the « Operational  
assessment » chapter (§6.2)

*(\*EMI, batteries, power source, environmental testing,  
portable display characteristics, viewable stowage)*



# Airworthiness approval process (§6.1)

- Scope of the Airworthiness approval process (§6.1):
  - Installed resources
  - Mounting device
  - Characteristics and placement of installed EFB Display
  - Power source
  - EFB Data Connectivity
  - Connecting Cables
  - Installed EFB



# Airworthiness approval process (§6.1)

## ► CHANGES from v1 :

### ► Installed resources (§6.1.1.1):

- resources can be shared with avionics (this possibility shall be part of the approved type design)





# Airworthiness approval process (§6.1)

## ► CHANGES from v1 :

### ► Display characteristics (§6.1.1.1.2 b):

- AMC 25-11 (§3.16a) can be used as an appropriate guidance material to assess luminance and legibility aspects





# Airworthiness approval process (§6.1)

## ➤ CHANGES from v1 :

### ➤ Power source (§6.1.1.1.3):

- Some considerations moved back from Appendix J  
(*connection to non-essential vs critical power bus, electrical load analysis, aircraft electrical network protection requirements*)
- Reference to EASA Certification Memo CM-ES-001  
(*Certification of Power Supply Systems for Portable Electronic Devices*)





# Airworthiness approval process (§6.1)

## ➤ CHANGES from v1 :

### ➤ EFB Data connectivity (§6.1.1.1.4):

- Portable EFB having data connectivity to aircraft systems, either wired or wireless, may receive or transmit data to and from aircraft systems, provided the connection (hardware and software for data connection provisions) and adequate interface protection devices are incorporated into the aircraft type design



Aircraft system



EFB



# Airworthiness approval process (§6.1)

## ► CHANGES from v1 :

### ► Connecting Cables (§6.1.1.5):

- New paragraph to distinguish connecting cables from design of the mounting device



### ► Installed EFB (§6.1.1.2):

- Data connectivity with certified aircraft systems was not authorized in AMC v1. Limitations superseded in AMC v6.1 by new data connectivity recommendations in § 6.1.1.1.4 (see previous slide 21)



# APPENDIX A – Examples of Type A Software Applications

- No changes from v1
- Novelty/rupture from TGL 36 :
  - **TGL 36** : Type A applications include pre-composed, fixed presentations of data currently presented in paper format.
  - **AMC 20-25** : EFB applications whose malfunction or misuse would have no adverse effect on the safety of any flight operation, i.e. a hazard level defined as no greater than a “no safety effect” failure condition classification.





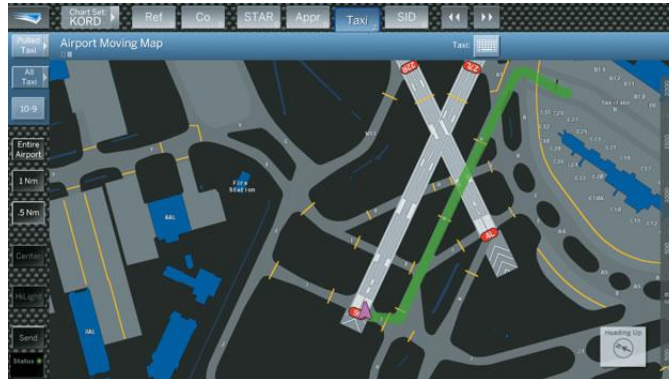
# APPENDIX A – Examples of Type A Software Applications

- Novelty/rupture from TGL 36 :
  - Consequences :
    - Some manuals to be carried by Regulations (e.g. OPS manual, AFM) are no longer Type A (even in PDF format)

# APPENDIX B – TYPE B SOFTWARE APPLICATIONS

## ➤ **Changes** from v1:

- Airport Moving Map Displays (AMMD) applications reclassified as Type B



- EASA no longer mentioned explicitly for the evaluation of Aircraft performance calculation application (evaluation may be requested 'voluntarily')



# APPENDIX C - Process for the Classification of Software Applications

## ➤ **Changes** from v1:

- Appendix is no longer limited to examples of Type C S/W applications
- Appendix describes the process for classifying Type A and Type B EFB applications based on the severity of failure conditions resulting from malfunctions and misuse (using AMC 25.1309 definitions)
- Applications, formerly called as « Type C » in AMC v1, are still not eligible as Type A or B in v6.1



# APPENDIX J - POWER SUPPLY CONSIDERATIONS FOR PORTABLE EFBS

## ► **Changes** from v1:

- Editorial only : some considerations moved from Appendix J to the body of AMC (§ 6.1.1.1.3)



# APPENDIX K - CONSIDERATIONS FOR RAPID DEPRESSURISATION TEST

- No Changes from v1
- Novelty from TGL 36
  - Rapid decompression testing requested (in accordance with EUROCAE ED-14G/RTCA DO-160F guidelines)





EUROPEAN AVIATION SAFETY AGENCY  
AGENCE EUROPÉENNE DE LA SÉCURITÉ AÉRIENNE  
EUROPÄISCHE AGENTUR FÜR FLUGSICHERHEIT

## 6.2 Operational Approval – Assessment

Paul Edwards – Chairman

Your safety is our mission.  
[easa.europa.eu](https://easa.europa.eu)



# 6.2 Operational Assessment

## Changes to Version 1

6.2.1 - H/W operational assessment is focused on portable EFB platforms rather than Class 1.

### 6.2.1.1 - EMI Demonstrations :

TC or STC data can be used as supporting material to demonstrate safe operational use – Further considerations maybe found in AMC1CAT.GEN.MPA.140

6.2.1.1. - Additional paragraphs describing PED & T-PED non-interference / compliance test method. Methods 1&2.

- Unwanted emissions : DO-160 section 21 cat M or test on a/c
- Intentional transmissions (TPED) : ED-130()/DO-294()



# Batteries – 6.2.1.2 – 6.2.1.5

- Changes from Version 1:
- Text reflect developments in batteries...

6.2.1.2 -Inclusion of new testing standards (consistent with FAA AC 120-76B).

6.2.1.3 – Power source rewording – appendix J refers

6.2.1.4 – Environmental testing – Rapid depressurisation - Slight wording changes - appendix K refers



# Viewable Stowage – 6.2.1.6

- Changes to Version 1
- Viewable stowage should comply to certain criteria detailed in - 6.1.1.1.1
- 6.1.1.1.1 v6.1 has slight additional wording and some re-location of paragraphs in comparison to 6.1.2.1 of v1. (NPA2012-02) – Big developments in viewable stowage – harmonisation with FAA! Not just knee boards.. Suction Cups.



# Software Operational Assessment

- Changes to Version 1
- Type A software applications never require an operational approval as before (no change from V1 but from TGL 36).
- Type B software applications do not require airworthiness approval, but should be assessed through the process described in Chapter 7. Documentation is listed in appendix F. List of Type B software applications that require documented evaluation is provided in appendix B.
- Miscellaneous software is outside the scope of the text but subject to operational rules.

# 7.0 Operational Assessment Processes

- Changes to Version 1
- Legal wording – editorial changes from ‘should’ to ‘may’ file an application to the agency. Removal of implications such as – ‘EASA is directly involved’.
- Evaluations do not ‘HAVE’ to be conducted by the Agency. They may be included but...do not have to be.
- More devolvment to competent authority as a whole (in line with Regulation 216/2008).



# Appendix F – Software Application Documentation

## ➤ Change from v1:

- §§ F.1 « *Additional Requirements for Performance Applications for Take-off, Landing and Mass & Balance Calculations* »
  - Significantly completed : testing, procedures, training, ...



# AMMD application with own ship position

- Appendix H guides the applicant in how to demonstrate the safe operational use of AMMD applications as a type B software application
- An AMMD shall NOT be used as the primary means of taxiing navigation & shall only be used in conjunction with other appropriate material
- The AMMD software & database shall be compliant with ETSO-2C165a or an equivalent standard (.... But the ETSO authorisation remains voluntary)
- Operators may use flight crew training to mitigate some hazards

# Appendix I – Final Operational Report

- “The competent authority may use the operational approval submission report as a compliance matrix against this AMC” – Removed as the appendix are only a guideline and not prescriptive.
- Removal of Class 1,2,3 – replaced with Portable and Installed



# Summary – Text and Appendices

The text and appendices are as very useful tool of reference, but are by no means intended to be fully prescriptive

The competent authority has discretion

Proposed text we feel is in line with industry expectations and is harmonized with the FAA

# Summary – Text and Appendices

The EFB of my dreams !





EUROPEAN AVIATION SAFETY AGENCY  
AGENCE EUROPÉENNE DE LA SÉCURITÉ AÉRIENNE  
EUROPÄISCHE AGENTUR FÜR FLUGSICHERHEIT

# Thank you...

# Questions?

Romuald Salgues - Airbus  
Paul Edwards – Chairman

Your safety is our mission.  
[easa.europa.eu](https://easa.europa.eu)