ANAC Autoridade Nacional da Aviação Civil *Portuguese Civil Aviation Authority*	**AUTORIDADE NACIONAL DA AVIAÇÃO CIVIL** **Direção de Operações de Voo** **Departamento de Transporte Aéreo** **REQUERIMENTO PARA APROVAÇÃO SPA.EFB (CAT)** **REQUERIMENTO PARA ACEITAÇÃO EFB (NCC/ SPO)** **REGULAMENTO (UE) 965/2012**

OPERATOR				
EFB Manager				
AOC				
Aircraft Model(s)				
Serial Number(s)				
Registration(s)				
Reg. Reference	**CAT SPA.EFB ☐**	**NCC.GEN.131 ☐**	**SPO.GEN.131 ☐**	
OM Reference:	**Edition:**	**Revision:**	**TR:**	**Date:**
EFB Manual	**Edition:**	**Revision:**	**TR:**	**Date:**

Equipament Data			
Manufacturer	**Model**	**P/N**	**S/N (if relevant)**
EFB Installed ☐		**EFB Portable ☐**	
Software Type A ☐	**Software Type B ☐**	**Other Software (not A or B) ☐**	

List of attached documentation to be used as reference (R):

1.
2.
3.
4.
5.
6.
7.
8.

When filling this form, the operator has to identify the source of evidence, using the document table reference above and list the section or precise location of the evidence for the demonstration of the fulfilment of the requirement-
E.g. if in the list above (attached documentation to be used as reference (R)), the point 1. is identified as OM (A), and the evidence of accomplishment of some item in the check list is in paragraph 8.9.1.1, you should refer: "1. §8.9.1.1."
The operator shall consider INI for initial and REV for revision of the applicable line.
Use S when the item is accomplished (include reference and location of evidence)
Use N/S when the item is not accomplished.

ANAC Autoridade Nacional da Aviação Civil Portuguese Civil Aviation Authority	**AUTORIDADE NACIONAL DA AVIAÇÃO CIVIL** **Direção de Operações de Voo** **Departamento de Transporte Aéreo** **REQUERIMENTO PARA APROVAÇÃO SPA.EFB (CAT)** **REQUERIMENTO PARA ACEITAÇÃO EFB (NCC/ SPO)** **REGULAMENTO (UE) 965/2012**

Use N/A when the item is not applicable.

Note: In reference ("R"), besides identifying the source of evidence and location the operator can also add any remarks thought to be useful for the process.

Please fill in Part 1 - Equipment and/or Part 2 - Applications as applicable to your requirement.

Evidences to be sent together with the application SPA.EFB.100:		**S**	**N**	**Remarks**
1.	**Risk Assessment related to the use of the EFB**	☐	☐	
2.	**Human-machine interfaces of EFB and EFB application assessed against Human factors principles**	☐	☐	
3.	**EFB administration System, procedures and training established and implemented**	☐	☐	
4.	**EFB host platform is suitable for the intended use of EFB application.**	☐	☐	

Part 1 - Equipment				
1.	**Installed EFB / installed resources**	**INI.**	**REV**	**S /NS/NA Reference:**
1.1.	Hardware airworthiness approval Installed resources require an airworthiness approval	☐	☐	☐/☐/☐ R:
1.1.1.	Installed resources. Description	☐	☐	☐/☐/☐ R:
1.1.2.	Mounting device	☐	☐	☐/☐/☐ R:
1.1.3.	Characteristics and placement of the EFB display	☐	☐	☐/☐/☐ R:
1.1.4.	EFB data connectivity. Portable EFBs that have data connectivity to aircraft systems, either wired or wireless.	☐	☐	☐/☐/☐ R:
1.1.5.	Connecting cables. When cabling is installed to mate aircraft systems with an EFB	☐	☐	☐/☐/☐ R:
1.1.6.	Certification documentation	☐	☐	☐/☐/☐ R:
1.1.7.	Aircraft flight manual	☐	☐	☐/☐/☐ R:

2.	**Portable EFB**	**INI.**	**REV**	**S /NS/NA Reference:**
2.1.	Technical prerequisites for the use of PEDs. As AMC1 CAT.GEN.MPA.140.	☐	☐	☐/☐/☐ R:

2. Portable EFB		INI.	REV	S /NS/NA Reference:
2.1.1.	(b) Prerequisites concerning the aircraft configuration (1) The operator should demonstrate that PEDs do not interfere with on-board electronic systems and equipment, especially with the aircraft's navigation and communication systems. (2) The assessment of PED tolerance may be tailored to the different aircraft zones: (i) the passenger compartment; (ii) the flight crew compartment; and (iii) areas not accessible during the flight.	☐	☐	☐/☐/☐ R:
2.1.2.	(c) Scenarios for permitting the use of PEDs	☐	☐	☐/☐/☐ R:
2.1.3.	(d) Demonstration of electromagnetic compatibility. EMI assessment at aircraft level.	☐	☐	☐/☐/☐ R:
2.1.4.	(e) Operational conditions of C-PEDs and cargo tracking devices	☐	☐	☐/☐/☐ R:
2.1.5.	(f) Batteries in C-PEDs and cargo tracking devices	☐	☐	☐/☐/☐ R:
2.2.	**Procedures for the use of PEDs** (AMC2 CAT.GEN.MPA.140)	☐	☐	☐/☐/☐ R:
2.2.1.	(b) Prerequisites. Before permitting the use of any kind of PEDs the operator should ensure compliance with (c) of AMC1 CAT.GEN.MPA.140.	☐	☐	☐/☐/☐ R:
2.2.2.	(e) Use of PEDs in the flight crew compartment.	☐	☐	☐/☐/☐ R:
2.2.3.	(1) The conditions for the use of PEDs in-flight are specified in the operations manual.	☐	☐	☐/☐/☐ R:
2.2.4.	(2) The PEDs do not pose a loose item risk or other hazard.	☐	☐	☐/☐/☐ R:
2.2.5.	(3) These provisions should not preclude use of a T-PED (specifically a mobile phone) by the flight crew to deal with an emergency. However, reliance should not be predicated on a T-PED for this purpose.	☐	☐	☐/☐/☐ R:
2.2.6.	(f) PEDs not accessible during the flight. PEDs should be switched off, when not accessible for deactivation during flight. This should apply especially to PEDs contained in baggage or transported as part of the cargo. The operator may permit deviation for PEDs for which safe operation has been demonstrated in accordance with AMC1 CAT.GEN.MPA.140. Other precautions, such as transporting in shielded metal boxes, may also be used to mitigate associated risks.	☐	☐	☐/☐/☐ R:
2.3.	**Use of electronic flight bags (AMC1 CAT.GEN.MPA.141(a) (EFBs). HARDWARE** Before using a portable EFB, the following considerations should be assessed by the operator:	☐	☐	☐/☐/☐ R:
2.3.1.	Portable EFBs are controlled PEDs (C-PEDs).	☐	☐	☐/☐/☐ R:

2. Portable EFB		INI.	REV	S /NS/NA Reference:
2.3.2.	A portable EFB should be capable of operation autonomously inside and outside the aircraft.	☐	☐	☐/☐/☐ R:
2.3.3.	Characteristics and placement of the EFB display. Proposed location of the display when the EFB is in use.	☐	☐	☐/☐/☐ R:
2.3.4.	Should be placed in such a way that they do not unduly impair the flight crew's external view during any of the phases of the flight.	☐	☐	☐/☐/☐ R:
2.3.5.	Should not impair the view of or access to any flight-crew-compartment control or instrument.	☐	☐	☐/☐/☐ R:
2.3.6.	The location should be assessed for their possible impact on egress requirements.	☐	☐	☐/☐/☐ R:
2.3.7.	When the EFB is in use (intended to be viewed or controlled), its display should be within 90 degrees on either side of each flight crew member's line of sight.	☐	☐	☐/☐/☐ R:
2.3.8.	(c) Power source. If the aircraft is equipped with electrical power outlet(s) in the flight crew compartment, the operator should ensure that their certified characteristics are compatible with the intended use of the EFB system.	☐	☐	☐/☐/☐ R:
2.3.9.	(d) **EFB data connectivity**. Portable EFBs may have data connectivity to aircraft systems, either wired or wireless, provided that the connections (hardware and software for data connection provisions) and adequate interface protection devices are incorporated into the aircraft type design.	☐	☐	☐/☐/☐ R:
2.3.10.	A portable EFB may receive any data from aircraft systems, but data transmission from EFBs should be limited to aircraft systems that have been certified for this intended purpose (refer to AMC 20-25 for more details).	☐	☐	☐/☐/☐ R:
2.3.11.	(e) **External connecting cables** (to avionics and/or power sources). When external cables are used to connect a portable EFB to the aircraft systems and/or to a power source, the following should apply:	☐	☐	☐/☐/☐ R:
2.3.12.	(1) cables should not hang loosely in a way that compromises task performance and safety;	☐	☐	☐/☐/☐ R:
2.3.13.	(2) cables should be of sufficient length so that they do not obstruct the use of any movable	☐	☐	☐/☐/☐ R:
2.3.14.	(f) Electromagnetic interference (EMI) demonstrations. See paragraph (b), (c) and (d) of AMC1 CAT.GEN.MPA.140.	☐	☐	☐/☐/☐ R:
2.3.15.	The EMI demonstration should cover any cable connected to the EFB as well as non-certified power chargers.	☐	☐	☐/☐/☐ R:
2.3.16.	(g) **Batteries**. See paragraph (f) of AMC1 CAT.GEN.MPA.140.	☐	☐	☐/☐/☐ R:
2.3.17.	(h) **Viewable stowage.** The evaluation should be performed for a given location in the flight deck, documented and be part of the EFB policy.	☐	☐	☐/☐/☐ R:
2.3.18.	(1) The viewable stowage and associated mechanisms should not impede the flight crew members in the performance of any task (whether normal, abnormal, or emergency) associated with operating any aircraft system;	☐	☐	☐/☐/☐ R:

2. Portable EFB		INI.	REV	S /NS/NA Reference:
2.3.19.	(2) When the viewable stowage is used to secure an EFB display, it should be able to be easily locked in position.	☐	☐	☐/☐/☐ R:
2.3.20.	(3) The viewable stowage should be designed and installed so that it will sustain all foreseeable conditions relative to the flight environment (e.g. severe turbulence, hard landings) while retaining its structural integrity and without becoming detached. The use of restraints of the device should be considered where appropriate;	☐	☐	☐/☐/☐ R:
2.3.21.	(4) A provision should be available to secure or lock the device in a position out of the way of flight crew operations when not in use	☐	☐	☐/☐/☐ R:
2.3.22.	(5) Possible mechanical interference issues of the viewable stowage should be prevented;	☐	☐	☐/☐/☐ R:
2.3.23.	(6) Adequate means should be provided (e.g. hardware or software) to shut down the portable EFB when its controls are not accessible by the flight crew members when strapped in the normal seated position; and	☐	☐	☐/☐/☐ R:
2.3.24.	(7) The viewable stowage device should be easily removable from the aircraft without the use of tools	☐	☐	☐/☐/☐ R:
2.3.25.	It should be demonstrated that if the EFB moves or is separated from its stowage, or if the viewable stowage is unsecured from the aircraft (as a result of turbulence, manoeuvring, or other action), it will not jam flight controls, damage flight deck equipment, or injure flight crew members.	☐	☐	☐/☐/☐ R:
2.3.26.	The risks associated with an EFB fire should be minimised by the design and location of the viewable stowage.	☐	☐	☐/☐/☐ R:
2.3.27.	See GM1 CAT.GEN.MPA.141(a) Use of electronic flight bags (EFBs). VIEWABLE STOWAGE for further guidance			

Part 2 – Application				
1.	**Included Type B applications evaluation**	**INI.**	**REV**	**S /NS/NA Reference:**
1.1.	Performance and Mass And Balance Applications Description: -	☐	☐	☐/☐/☐ R:
1.2.	Airport Moving Map Display (AMMD) with Own-Ship Pos. Description: -	☐	☐	☐/☐/☐ R:
1.3.	Use of Commercial Off-The-Shelf (COTS) Position Source Description: -	☐	☐	☐/☐/☐ R:
1.4.	Chart applications Description: -	☐	☐	☐/☐/☐ R:
1.5.	In-flight weather applications Description: -	☐	☐	☐/☐/☐ R:
1.6.	Applications displaying own-ship position in flight Description:	☐	☐	☐/☐/☐ R:

	-			
1.7.	Other: Description: -	☐	☐	☐/☐/☐ R:

NOTE: In tables 2 to 8, in case of updates or revisions, check the ones that apply. All others keep NA. In case of application's update NOT CHANGING the calculation methodology or the human-machine interface go to section 9 below.

2.	**Performance And Mass And Balance Applications** Refer to AMC5 SPA.EFB.100(b)(3) for full details	INI.	REV	S /NS/NA Reference:
2.1.	EFB Applications with ETSO Authorisations. EFB software applications may be approved by EASA e.g. by means of an ETSO authorisation. Such approved EFB applications are considered to be compliant with the requirements of SPA.EFB.100(b). **If application holds an EASA ETSO, requirement's demonstration is not required**	☐	☐	☐/☐/☐ R:
2.2.	General. Performance and mass and balance applications should be based on existing published data found in the AFM or performance manual, and should account for the applicable CAT.POL performance requirements	☐	☐	☐/☐/☐ R:
2.3.	The integrity of the database files related to performance and to mass and balance (the performance database, airport database, etc.) should be checked by the program before performing any calculations. This check can be run once at the start-up of the application.	☐	☐	☐/☐/☐ R:
2.4.	Each software version should be identified by a unique version number	☐	☐	☐/☐/☐ R:
2.5.	The operator should have procedures in place to retain this information for at least 3 months	☐	☐	☐/☐/☐ R:
2.6.	The operator should ensure that aircraft performance or mass and balance data provided by the application is correct compared with the data derived from the AFM. A representative cross-check of conditions (e.g. for take-off and landing performance applications data on dry, wet, and contaminated runways, with different wind conditions and aerodrome pressure altitudes, etc.) shall be included – **Accuracy test**	☐	☐	☐/☐/☐ R:
2.7.	The operator should establish procedures to define any new roles that the flight crew and, if applicable, the flight dispatcher, may have in creating, reviewing, and using performance calculations supported by EFB systems	☐	☐	☐/☐/☐ R:
2.8.	In particular, the procedures should address cases where discrepancies are identified by the flight crew	☐	☐	☐/☐/☐ R:
2.9.	**Testing**. The demonstration of the compliance of a performance or mass and balance application should include evidence of the software testing activities performed with the software version candidate for operational use. The testing activities should include human-machine interface (HMI) testing, reliability testing, and accuracy testing	☐	☐	☐/☐/☐ R:
2.10.	Any difference compared to the reference data that is judged significant should be examined and explained. When differences are due to more conservative calculations or reduced margins that were purposely built into the approved data, this approach should be clearly mentioned	☐	☐	☐/☐/☐ R:

2. **Performance And Mass And Balance Applications** Refer to AMC5 SPA.EFB.100(b)(3) for full details	INI.	REV	S /NS/NA **Reference:**
2.11. Procedures. Flight crew procedures concerning take-off and landing performance or mass and balance applications. Ensure that: (1) calculations are performed independently by each flight crew member before data outputs are accepted for use	☐	☐	☐/☐/☐ R:
2.12. (2) a formal cross-check is made before data outputs are accepted for use; such cross-checks should utilise the independent calculations described above, together with the output of the same data from other sources on the aircraft	☐	☐	☐/☐/☐ R:
2.13. (3) a gross-error check is performed before data outputs are accepted for use; such gross-error checks may use either a 'rule of thumb' or the output of the same data from other sources on the aircraft; and	☐	☐	☐/☐/☐ R:
2.14. (4) in the event of a loss of functionality of an EFB through either the loss of a single application, or the failure of the device hosting the application, an equivalent level of safety can be maintained; consistency with the EFB risk assessment assumptions should be confirmed	☐	☐	☐/☐/☐ R:
2.15. Training. The training should emphasise the importance of executing all take-off and landing performance or mass and balance calculations in accordance with the SOPs to assure fully independent calculations	☐	☐	☐/☐/☐ R:
2.16. Specific considerations for mass and balance applications. In addition to the figures, a diagram displaying the mass and its associated centre-of-gravity (CG) position should be provided	☐	☐	☐/☐/☐ R:
2.17. Human-factors-specific considerations	☐	☐	☐/☐/☐ R:
2.17.1. Input and output data (i.e. results) shall be clearly separated from each other	☐	☐	☐/☐/☐ R:
2.17.2. All input and output data should include correct and unambiguous terms (names), units of measurement (e.g. kg or lb), and, when applicable, an index system and a CG-position declaration (e.g. Arm/%MAC). The units should match the ones from the other flight-crew-compartment sources for the same kind of data	☐	☐	☐/☐/☐ R:
2.17.3. Airspeeds should be provided in a form that is directly useable in the flight crew compartment, unless the unit clearly indicates otherwise (e.g. Knots Calibrated Air Speed (KCAS)). Any difference between the type of airspeed provided by the EFB application and the type provided by the aircraft flight manual (AFM) or flight crew operating manual (FCOM) performance charts should be mentioned in the flight crew guides and training material	☐	☐	☐/☐/☐ R:
2.17.4. If the landing performance application allows the computation of both dispatch (regulatory, factored) and other results (e.g. in-flight or unfactored), flight crew members should be made aware of the computation mode used	☐	☐	☐/☐/☐ R:
2.17.5. (1) Inputs: The application should allow users to clearly distinguish user entries from default values or entries imported from other aircraft systems. Performance applications should enable the flight crew to check whether a certain obstacle is included in the performance calculations and/or to include new or revised obstacle information in the performance calculations	☐	☐	☐/☐/☐ R:

2.	**Performance And Mass And Balance Applications** Refer to AMC5 SPA.EFB.100(b)(3) for full details	INI.	REV	S /NS/NA **Reference:**
2.17.6.	(2) Outputs: All critical assumptions for performance calculations (e.g. the use of thrust reversers, full or reduced thrust/power rating) should be clearly displayed. The assumptions made about any calculation should be at least as clear to the flight crew members as similar information would be on a tabular chart. All output data should be available in numbers. The application should indicate when a set of entries results in an unachievable operation (for instance, a negative stopping margin) with a specific message or colour scheme. This should be done in accordance with the relevant provisions on messages and the use of colours. In order to allow a smooth workflow and to prevent data entry errors, the layout of the calculation outputs should be such that it is consistent with the data entry interface of the aircraft applications in which the calculation outputs are used (e.g. flight management systems).	☐	☐	☐/☐/☐ R:
2.17.7.	(3) Modifications: The user should be able to easily modify performance calculations, especially when making last minute changes. The results of calculations and any outdated input fields should be deleted whenever: (i) modifications are entered; (ii) the EFB is shut down or the performance application is closed; or (iii) the EFB or the performance application has been in a standby or 'background' mode for too long, i.e. such that it is likely that when it is used again, the inputs or outputs will be outdated.	☐	☐	☐/☐/☐ R:

3.	**Airport Moving Map Display (AMMD) Application With Own-Ship Position** Refer to AMC6 SPA.EFB.100(b)(3) for full details	INI.	REV	S /NS/NA **Reference:**
3.1.	EFB Applications with ETSO Authorisations. EFB software applications may be approved by EASA e.g. by means of an ETSO authorisation. Such approved EFB applications are considered to be compliant with the requirements of SPA.EFB.100(b). **If application holds an EASA ETSO, requirement's demonstration is not required**	☐	☐	☐/☐/☐ R:
3.2.	General. An AMMD application should not be used as the primary means of navigation for taxiing and should be only used in conjunction with other materials and procedures identified within the operating concept. When an AMMD is in use, the primary means of navigation for taxiing remains the use of normal procedures and direct visual observation out of the flight-crew-compartment window	☐	☐	☐/☐/☐ R:
3.3.	Minimum requirements. AMMD software that complies with European Technical Standard Order ETSO-C165a is considered to be acceptable	☐	☐	☐/☐/☐ R:
3.4.	The system should provide the means to display the revision number of the software installed	☐	☐	☐/☐/☐ R:

3.	**Airport Moving Map Display (AMMD) Application With Own-Ship Position** Refer to AMC6 SPA.EFB.100(b)(3) for full details	**INI.**	**REV**	**S /NS/NA** **Reference:**
3.5.	To achieve the total system accuracy requirements of ETSO-C165a, **an airworthiness-approved sensor using the global positioning system (GPS) in combination with a medium-accuracy database compliant with EUROCAE ED-99C/RTCA DO-272C,** 'User Requirements for Aerodrome Mapping Information,' (or later revisions) is considered one acceptable means	☐	☐	☐/☐/☐ R:
3.6.	Alternatively, the use of non-certified commercial off-the-shelf (COTS) position sources may be acceptable in accordance with AMC7 SPA.EFB.100(b)(3). **CHECK Section 4 below**	☐	☐	☐/☐/☐ R:
3.7. **3.7.1.** **3.7.2.** **3.7.3.** **3.7.4.** **3.7.5.** **3.7.6.**	**Data provided by the AMMD** software application developer. The operator should ensure that the AMMD software application developer provides the appropriate data including: (1) installation instructions or the equivalent as per ETSO-C165a Section 2.2 that address: (i) the identification of each specific EFB system computing platform (including the hardware platform and the operating system version) with which this AMMD software application and database was demonstrated to be compatible; (ii) the installation procedures and limitations for each applicable platform (e.g. required memory resources, configuration of Global Navigation Satellite System (GNSS) antenna position); (iii) the interface description data including the requirements for external sensors providing data inputs; and (iv) means to verify that the AMMD has been installed correctly and is functioning properly. (2) any AMMD limitations, and known installation, operational, functional, or performance issues of the AMMD.	☐	☐	☐/☐/☐ R:
3.8.	**AMMD software installation in the EFB**. The operator should review the documents and the data provided by the AMMD developer, and ensure that the installation requirements of the AMMD software in the specific EFB platform and aircraft are addressed. Operators are required to perform any verification activities proposed by the AMMD software application developer, as well as identify and perform any additional integration activities that need to be completed; and	☐	☐	☐/☐/☐ R:
3.9.	**Operational procedures**. Changes to operational procedures of the aircraft (e.g. flight crew procedures) should be documented in the operations manual or user's guide as appropriate. In particular, the documentation should highlight that the AMMD is only designed to assist flight crew members in orienting themselves on the airport surface so as to improve the flight crew members' positional awareness during taxiing, and that it is not to be used as the basis for ground manoeuvring.	☐	☐	☐/☐/☐ R:

3.	**Airport Moving Map Display (AMMD) Application With Own-Ship Position** Refer to AMC6 SPA.EFB.100(b)(3) for full details	**INI.**	**REV**	**S /NS/NA** **Reference:**
3.10.	**Training requirements.** The operator may use flight crew procedures to mitigate some hazards. These should include limitations on the use of the AMMD function or application. As the AMMD could be a compelling display and the procedural restrictions are a key component of the mitigation, training should be provided in support of an AMMD. All mitigation means that rely on flight crew procedures should be included in the flight crew training. Details of the AMMD training should be included in the operator's overall EFB training	☐	☐	☐/☐/☐ R:

4.	**Use Of Commercial Off-The-Shelf (Cots) Position Source** Refer to AMC7 SPA.EFB.100(b)(3) for full details.	**INI.**	**REV**	**S /NS/NA** **Reference:**
4.1.	EFB Applications with ETSO Authorisations. EFB software applications may be approved by EASA e.g. by means of an ETSO authorisation. Such approved EFB applications are considered to be compliant with the requirements of SPA.EFB.100(b). **If application holds an EASA ETSO, requirement's demonstration is not required**	☐	☐	☐/☐/☐ R:
4.2.	**COTS positions sources** may be used for AMMD EFB applications and for EFB applications displaying the own-ship position in-flight when the following considerations are complied with:			
4.3.	**Characterisation of the receiver.** The position sould originate from an airworthiness approved GNSS receiver, or from a COTS GNSS receiver fully characterised in terms of technical specifications and featuring an adequate number of channels (12 or more). The EFB application should, in addition to position and velocity data, receive a sufficient number of parameters related to the fix quality and integrity to allow compliance with the accuracy requirements (e.g. the number of satellites and constellation geometry parameters such as dilution of position (DOP), 2D/3D fix).	☐	☐	☐/☐/☐ R:
4.4.	**Installation aspects**. If the COTS position sources are stand-alone PEDs, they should be treated as C-PEDs and their installation and use should follow the requirements of CAT.GEN.MPA.140. If an external COTS position source transmits wirelessly, cyber security aspects have to be considered. Non-certified securing systems should be assessed according to paragraph (h) of AMC1 CAT.GEN.MPA.141(a).	☐	☐	☐/☐/☐ R:
4.5. **4.5.1.** **4.5.2.**	**Practical evaluation**. As variables can be introduced by the placement of the antennas in the aircraft and the characteristics of the aircraft itself (e.g. heated and/or shielded windshield effects), the tests have to take place on the type of aircraft in which the EFB will be operated, with the antenna positioned at the location to be used in service. (1) COTS used as a position source for AMMD. The test installation should record the data provided by the COTS position source to the AMMD application. The analysis should use the recorded parameters to demonstrate that the AMMD requirements are satisfactorily complied with in terms of the total system accuracy (taking into account database errors, latency effects, display errors, and uncompensated antenna offsets) within 50 metres (95 %). The availability should be sufficient	☐	☐	☐/☐/☐ R:

4.	**Use Of Commercial Off-The-Shelf (Cots) Position Source** Refer to AMC7 SPA.EFB.100(b)(3) for full details.	INI.	REV	S /NS/NA **Reference:**
	to prevent distraction or increased workload due to frequent loss of position. **4.5.3.** When demonstrating compliance with the following requirements of DO-257A, the behaviour of the AMMD system should be evaluated in practice: **4.5.4.** (i) indication of degraded position accuracy within 1 second (Section 2.2.4 (22)); and **4.5.5.** (ii) indication of a loss of positioning data within 5 seconds (Section 2.2.4 (23)); conditions to consider are both a loss of the GNSS satellite view (e.g. antenna failure) and a loss of communication between the receiver and the EFB. **4.5.6.** (2) COTS position source used for applications displaying own-ship position in flight: **4.5.7.** Flight trials should demonstrate that the COTS GNSS availability is sufficient to prevent distraction or increased workload due to frequent loss of position.			
4.6.	**GM5 SPA.EFB.100(b)(3). Practical Evaluation**. The tests should consist of a statistically relevant sample of taxiing. It is recommended to include taxiing at airports that are representative of the more complex airports typically accessed by the operator. Taxiing segment samples should include data that is derived from runways and taxiways, and should include numerous turns, in particular of 90 degrees or more, and segments in straight lines at the maximum speed at which the own-ship symbol is displayed. Taxiing segment samples should include parts in areas of high buildings such as terminals. The analysis should include at least 25 inbound and/or outbound taxiing segments between the parking location and the runway. During the tests, any unusual events (such as observing the own-ship symbol in a location on the map that is notably offset compared to the actual position, the own-ship symbol changing to non-directional when the aircraft is moving, and times when the own-ship symbol disappears from the map display) should be noted. For the test, the pilot should be instructed to diligently taxi on the centre line.	☐	☐	☐/☐/☐ R:

5.	**CHART APPLICATIONS** Refer to AMC8 SPA.EFB.100(b)(3) for full details.	INI.	REV	S /NS/NA **Reference:**
5.1.	EFB Applications with ETSO Authorisations. EFB software applications may be approved by EASA e.g. by means of an ETSO authorisation. Such approved EFB applications are considered to be compliant with the requirements of SPA.EFB.100(b). **If application holds an EASA ETSO, requirement's demonstration is not required.**	☐	☐	☐/☐/☐ R:
5.2.	The navigation charts that are depicted should contain the information necessary, in an appropriate form, to perform the operation safely. Consideration should be given to the size, resolution and position of the display to ensure legibility whilst retaining the ability to review all the information required to maintain adequate situational awareness.	☐	☐	☐/☐/☐ R:
5.3.	In the case of chart application displaying own-ship position in-flight, AMC10 SPA.EFB.100(b)(3) is applicable.	☐	☐	☐/☐/☐ R:

6.	**IN-FLIGHT WEATHER APPLICATIONS** Refer to AMC9 SPA.EFB.100(b)(3) for full details.	**INI.**	**REV**	**S /NS/NA** **Reference:**
6.1.	EFB Applications with ETSO Authorisations. EFB software applications may be approved by EASA e.g. by means of an ETSO authorisation. Such approved EFB applications are considered to be compliant with the requirements of SPA.EFB.100(b). **If application holds an EASA ETSO, requirement's demonstration is not required.**	☐	☐	☐/☐/☐ R:
6.2.	General. An in-flight weather (IFW) application is an EFB function or application enabling the flight crew to access meteorological information. It is designed to increase situational awareness and to support the flight crew when making strategic decisions. The use of IFW applications should be non-safety-critical and not necessary for the performance of the flight. IFW data should not be used to support tactical decisions and/or as a substitute for certified aircraft systems (e.g. weather radar). Any current information from the meteorological documentation required to be carried on board or from aircraft primary systems should always prevail over the information from an IFW application.	☐	☐	☐/☐/☐ R:
6.3.	The displayed meteorological information may be forecasted and/or observed, and may be updated on the ground and/or in flight. It should be based on data from certified meteorological service providers or other reliable sources evaluated by the operator.	☐	☐	☐/☐/☐ R:
6.4.	The meteorological information provided to the flight crew should be, as far as possible, consistent with the information available to users of ground-based aviation meteorological information (e.g. operations control centre (OCC) staff, flight dispatchers, etc.) in order to establish common situational awareness and to facilitate collaborative decision-making.	☐	☐	☐/☐/☐ R:
6.5. **6.5.1.** **6.5.2.** **6.5.3.** **6.5.4.** **6.5.5.**	Display.Should enable the flight crew to: (1) distinguish between observed and forecasted weather data; (2) identify the currency or age and validity time of the weather data; (3) access the interpretation of the weather data (e.g. the legend); (4) obtain positive and clear indications of any missing information or data and determine areas of uncertainty when making decisions to avoid hazardous weather; and (5) be aware of the status of the data link that enables the necessary IFW data exchanges.	☐	☐	☐/☐/☐ R:
6.6.	Meteorological information in IFW applications may be displayed as an overlay. If meteorological information is overlaid on navigation charts, special consideration should be given to HMI issues in order to avoid adverse effects on the basic chart functions.	☐	☐	☐/☐/☐ R:
6.7.	In case of display of own-ship position in flight, AMC10 SPA.EFB.100(b)(3) is applicable.	☐	☐	☐/☐/☐ R:
6.8.	The meteorological information may require reformatting to accommodate for example the display size or the depiction technology. However, any reformatting of the meteorological information should preserve both the geo-location and intensity of the meteorological conditions regardless of projection, scaling, or any other types of processing.	☐	☐	☐/☐/☐ R:
6.9.	Training and procedures. The operator should establish procedures for the use of an IFW application. The operator should provide adequate training to the flight crew	☐	☐	☐/☐/☐ R:

6.	**IN-FLIGHT WEATHER APPLICATIONS** Refer to AMC9 SPA.EFB.100(b)(3) for full details.	INI.	REV	S /NS/NA **Reference:**
	members before using an IFW application. This training should address:			
6.9.1.	(1) limitations of the use of an IFW application:			
6.9.2.	(i) acceptable use (strategic planning only);			
6.9.3.	(ii) information required to be on board; and			
6.9.4.	(iii) latency of observed weather information and the hazards associated with utilisation of old information;			
6.9.5.	(2) information on the display of weather data:			
6.9.6.	(i) type of displayed information (forecasted, observed);			
6.9.7.	(ii) symbology (symbols, colours); and			
6.9.8.	(iii) interpretation of meteorological information;			
6.9.9.	(3) identification of failures and malfunctions (e.g. incomplete uplinks, data-link failures, missing info);			
6.9.10.	(4) human factors issues:			
6.9.11.	(i) avoiding fixation; and			
6.9.12.	(ii) managing workload.			
6.10.	**GM4 SPA.EFB.100(b)(3). 'Reliable sources'** of data used by IFW applications are the organisations evaluated by the operator as being able to provide an appropriate level of data assurance in terms of accuracy and integrity. It is recommended that the following aspects be considered during that evaluation:			
6.10.1.	(a) The organisation should have a quality assurance system in place that covers the data source selection, acquisition/import, processing, validity period check, and the distribution phase;			
6.10.2.	(b) Any meteorological product provided by the organisation that is within the scope of the meteorological information included in the flight documentation as defined in MET.TR.215(e) (Annex V (Definitions of terms used in Annexes II to XIII) to Commission Implementing Regulation (EU) 2016/13771) should originate only from authoritative sources or certified providers and should not be transformed or altered, except for the purpose of packaging the data in the correct format. The organisation's process should provide assurance that the integrity of those products is preserved in the data for use by the IFW application.	☐	☐	☐/☐/☐ R:

7.	**Applications Displaying Own-Ship Position In Flight** Refer to AMC10 SPA.EFB.100(b)(3) for full details.	INI.	REV	S /NS/NA **Reference:**
7.1.	EFB Applications with ETSO Authorisations. EFB software applications may be approved by EASA e.g. by means of an ETSO authorisation. Such approved EFB applications are considered to be compliant with the requirements of SPA.EFB.100(b). **If application holds an EASA ETSO, requirement's demonstration is not required.**	☐	☐	☐/☐/☐ R:

7.	**Applications Displaying Own-Ship Position In Flight** Refer to AMC10 SPA.EFB.100(b)(3) for full details.	INI.	REV	S /NS/NA **Reference:**
7.2.	Limitations	☐	☐	☐/☐/☐ R:
7.2.1.	The display of own-ship position in flight as an overlay to other EFB applications should not be used as a primary source of information to fly or navigate the aircraft.			
7.2.2.	Except on VFR flights over routes navigated by reference to visual landmark, the display of the own-ship symbol is allowed only in aircraft having a certified navigation display (moving map).			
7.2.3.	In the specific case of IFW applications, the display of own-ship on such applications is restricted to aircraft equipped with a weather radar.			
7.3.	Position source and accuracy. The display of own-ship position may be based on a certified GNSS or GNSS-based (e.g. GPS/IRS) position from certified aircraft equipment or on a portable COTS position source in accordance with AMC7 SPA.EFB.100(b)(3).	☐	☐	☐/☐/☐ R:
7.4.	The own-ship symbol should be removed and the flight crew notified if:	☐	☐	☐/☐/☐ R:
7.4.1.	(1) the position source indicates a degraded accuracy. The threshold to consider that the accuracy is degraded should be commensurate with the navigation performance required for the current phase of flight and should not exceed 200 m when the own-ship is displayed above a terminal chart (i.e. SID, STAR, or instrument approach) or a depiction of a terminal procedure;			
7.4.2.	(2) the position data is reported as invalid by the GNSS receiver; or			
7.4.3.	(3) the position data is not received for 5 seconds.			
7.5.	Charting data considerations. If the map involves raster images that have been stitched together into a larger single map, it should be demonstrated that the stitching process does not introduce distortion or map errors that would not correlate properly with a GNSS-based own-ship symbol.	☐	☐	☐/☐/☐ R:
7.6.	Human machine interface (HMI)	☐	☐	☐/☐/☐ R:
7.6.1.	(1) **Interface**. The flight crew should be able to unambiguously differentiate the EFB function from avionics functions available in the cockpit, and in particular with the navigation display. A sufficiently legible text label 'AIRCRAFT POSITION NOT TO BE USED FOR NAVIGATION' or equivalent should be continuously displayed by the application if the own-ship position depiction is visible in the current display area over a terminal chart (i.e. SID, STAR, or instrument approach) or a depiction of a terminal procedure.			
7.6.2.	(2) **Display of own-ship symbol.** The own-ship symbol should be different from the ones used by certified aircraft systems intended for primary navigation. If directional data is available, the own-ship symbol may indicate directionality. If direction is not available, the own-ship symbol should not imply directionality. The colour coding should not be inconsistent with the manufacturer philosophy.			

7.	**Applications Displaying Own-Ship Position In Flight** Refer to AMC10 SPA.EFB.100(b)(3) for full details.	INI.	REV	S /NS/NA **Reference:**
7.6.3.	(3) **Data displayed**. The current map orientation should be clearly, continuously and unambiguously indicated (e.g., Track-up vs North-up). If the software supports more than one directional orientation for the own-ship symbol (e.g., Track-up vs North-up), the current own-ship symbol orientation should be indicated. The chart display in track-up mode should not create usability or readability issues. In particular, chart data should not be rotated in a manner that affects readability. The application zoom levels should be appropriate for the function and content being displayed and in the context of providing supplemental position awareness. The pilot should be able to obtain information about the operational status of the own-ship function (e.g. active, deactivated, degraded).	☐	☐	☐/☐/☐ R:
7.6.4.	**During IFR, day-VFR without visual references or night VFR flight,** the following parameters' values should not be displayed: (i) Track/heading; (ii) Estimated time of arrival (ETA); (iii) Altitude; (iv) Geographical coordinates of the current location of the aircraft; and (v) Aircraft speed.	☐	☐	☐/☐/☐ R:
7.6.5. **7.6.6.**	(4) **Controls**. If a panning and/or range selection function is available, the EFB application should provide a clear and simple method to return to an own-ship-oriented display. A means to disable the display of the own-ship position should be provided to the flight crew. .	☐	☐	☐/☐/☐ R:
7.7.	**Training and procedures**. The procedures and training should emphasise the fact that the display of own-ship position on charts or IFW EFB applications should not be used as a primary source of information to fly or navigate the aircraft or as a primary source of weather information.	☐	☐	☐/☐/☐ R:
7.7.1.	(1) **Procedures**. The following considerations should be addressed in the procedures for the use of charts or IFW EFB application displaying the own-ship position in flight by the flight crew: (i) Intended use of the display of own-ship position in flight on charts or IFW EFB applications; (ii) Inclusion of the EFB into the regular scan of flight deck systems indications. In particular, systematic cross-check with avionics before being used, whatever the position source; and (iii) Actions to be taken in case of identification of a discrepancy between the EFB and avionics.	☐	☐	☐/☐/☐ R:
7.7.2.	(2) Training. Crew members should be trained on the procedures for the use of the application, including the regular cross-check with avionics and the action in case of discrepancy.	☐	☐	☐/☐/☐ R:
7.8.	GM6 SPA.EFB.100(b)(3). The depiction of a circle around the EFB own-ship symbol may be used to differentiate it from the avionics one.	☐	☐	☐/☐/☐ R:

8.	**OTHER TYPE B APPLICATION** Refer to AMC3 CAT.GEN.MPA.141(b) for full details	INI.	REV	S /NS/NA **Reference:**
8.1.	EFB Applications with ETSO Authorisations. EFB software applications may be approved by EASA e.g. by means of an ETSO authorisation. Such approved EFB applications are considered to be compliant with the requirements of SPA.EFB.100(b). **If application holds an EASA ETSO, requirement's demonstration is not required.**	☐	☐	☐/☐/☐ R:
8.2.	If application is displaying own-ship position in-flight, AMC10 SPA.EFB.100(b)(3) is applicable.	☐	☐	☐/☐/☐ R:
8.3. **8.3.1.** **8.3.2.** **8.3.3.** **8.3.4.** **8.3.5.** **8.3.6.**	Document browsers that display the manuals and additional information and forms required to be carried by regulations and that are necessary for the safe operation of the aircraft, such as: (1) the operations manual (including MEL and CDL); (2) the aircraft flight manual, or equivalent document; (3) the operational flight plan; (4) meteorological information with graphical interpretation; (5) air traffic services (ATS) flight plan; (6) notices to airmen (NOTAMs) and aeronautical information service (AIS) briefing documentation.	☐	☐	☐/☐/☐ R:
8.4.	Applications that make use of the aeronautical operational control (AOC) communications to collect, process and then disseminate operational data.	☐	☐	☐/☐/☐ R:
8.5.	Other:	☐	☐	☐/☐/☐ R:

9.	**CHANGES** Refer to AMC2 SPA.EFB.100(b) for full details	INI.	REV	S /NS/NA **Reference:**
9.1.	Modifications to an EFB system may have to be introduced either by the EFB system supplier, the EFB applications developer, or by the operator itself.	☐	☐	☐/☐/☐ R:
9.2. **9.2.1.**	Those modifications that: (a)do **not result in a hardware change** that would **require a re-evaluation of the HMI** and human factors aspects in accordance with AMC1 SPA.EFB.100(b)(2);	☐	☐	☐/☐/☐ R:
9.2.2.	(b) do **not** bring any **change to the calculation algorithms** of a type B EFB application;	☐	☐	☐/☐/☐ R:
9.2.3.	(c) do **not** bring any **change to the HMI** of a type B EFB application that **requires a change to the flight crew training** programme or operational procedures;	☐	☐	☐/☐/☐ R:
9.2.4.	(d) introduce a new type A EFB application or modify an existing one (provided its software classification remains type A);	☐	☐	☐/☐/☐ R:
9.2.5.	(e) **do not introduce any additional functionality to an existing type B EFB** application; or	☐	☐	☐/☐/☐ R:
9.2.6.	(f) **update an existing database** necessary to use an existing type B EFB application, **may be introduced by the operator without the need to be approved by its competent authority**.	☐	☐	☐/☐/☐ R:
9.3.	These changes should, nevertheless, be controlled and properly tested prior to use during flights. The modifications in the following non-exhaustive list are considered to meet these criteria:	☐	☐	☐/☐/☐ R:

9.	**CHANGES** Refer to AMC2 SPA.EFB.100(b) for full details	**INI.**	**REV**	**S /NS/NA** **Reference:**
9.3.1. **9.3.2.** **9.3.3.** **9.3.4.**	(a) operating system updates; (b) chart or airport database updates; (c) updates to introduce fixes (i.e. patches); and (d) installation and modification of a type A EFB application.			
9.4.	For all other types of modification, the operator should apply the change management procedure approved by the competent authority in accordance with ARO.GEN.310(c). This includes the extension of the use of an EFB system, for which the operator already holds an approval, to another aircraft type of the operator's fleet.	☐	☐	☐/☐/☐ R:
9.5.	In the specific case of a complete change of the hardware hosting the EFB application, the operator should demonstrate to its competent authority that the new hardware is suitable for the intended use of the EFB application as per AMC1 SPA.EFB.100(b). **THIS CHANGE IS TO BE CONSIDERED AS EQUIPMENT CHANGE.**	☐	☐	☐/☐/☐ R:
Notes or comments:				
The operator Data: ____/____/____				_____ (Assinatura)