CIVIL AVIATION AUTHORITY OF THE PHILIPPINES

ADVISORY CIRCULAR AC 07-004

APPLICATION & PROCESS: CABIN ELECTRONIC FLIGHT BAG

SECTION 1 POLICY & GENERAL INFORMATION

1.1 PURPOSE

The purpose of this Advisory Circular is to provide the operators direction and guidelines on the approval of implementation and use of Cabin Electronic Flight Bags (C-EFB) by cabin crew members.

1.2 STATUS OF THIS AC

This AC is an original issuance.

1.3 BACKGROUND

A. An Electronic Flight Bag (EFB) is defined as an electronic information system, comprised of equipment and applications for crew, which allows storing, updating, displaying and processing of EFB functions to support flight operations or duties.

B. An EFB is a management device that may help crew members perform flight-related tasks more easily and efficiently with less paper.

C. Although EFBs were originally developed for flight crew to perform flight management tasks, EFBs are presently used in cabin operations. An EFB developed for cabin operations is referred to as a Cabin Electronic Flight Bag (C-EFB).

D. The C-EFB must have the prior approval of the CAAP before use in aircraft operations. The approval will be based on the guidelines presented in this circular.

1.4 APPLICABILITY

The guidance in this AC is applicable to all operators seeking CAAP authorization and approval to use Cabin Electronic Flight Bag and replace the required paper-based information or utilize other select software applications as part of the EFB functions.

1.5 RELATED REGULATIONS

- PCAR Part 7, Aircraft Instruments & Equipment
- PCAR Part 9, AOC Certification & Administration
- PCAR Part 8, Operations of Aircraft

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1.7 RELATED PUBLICATIONS

For further information on this topic, operators are advised to review the following publicationsand regulatory requirements—

Copies may be obtained from the CAAP Flight Standards Service Inspectorate.

1) Civil Aviation Authority of Philippines
   - ♦ MC 07-2020, Incorporation of Electronic Flight Bags
2) International Civil AviationOrganization (ICAO)
   - ♦ Annex 6, Part International Commercial Air Transport, Aeroplanes
   - ♦ Doc 10111, Manual on the Implementation and Use of Cabin Electronic Flight Bags

Copies may be obtained from Document Sales Unit, ICAO, 999 University Street, Montreal, Quebec, Canada H3C 5H7.

1.8 DEFINITION OF TERMS

1) Authority – Refers to the Civil Aviation Authority of the Philippines.
2) Cabin crew member – A crew member who performs, in the interest of safety of passengers, duties assigned by the operator or pilot-in-command of the aircraft, but who shall not act as a flight crew member.
3) Cabin electronic flight bag (C-EFB) – An electronic information system, comprised of equipment and applications for cabin crew, which allows for the storing, updating, displaying and processing of C-EFB functions to support flight and cabin operations or duties.
4) Change management – A formal process to manage changes within an organization in a systematic manner, so that changes which may impact identified hazards and risk mitigation strategies are accounted for, before the implementation of such changes.
5) Crew member – A person assigned by an operator to duty on an aircraft during a flight duty period.
6) Critical phases of flight – A period of high workload on the flight deck, normally being the periods between the beginning of taxiing until the aircraft is on the route climb phase and between the final part of descent to aircraft parking.
7) Electronic flight bag (EFB) – An electronic system, comprised of equipment and applications for flight crew which allows for the storing, updating, displaying and processing of EFB functions to support flight operations or duties.
8) EFB software application – Software hosted on an EFB platform, providing one or more EFB functions.
9) Flight crew member – A licensed crew member charged with duties essential to the operation of an aircraft during a flight duty period.
10) Hazard – A condition or an object with the potential to cause or contribute to an aircraft incident or accident.
11) Installed resources – Hardware/software installed in accordance with airworthiness requirements.

12) Independent EFB platforms – Multiple EFB platforms that are designed in such a way that no single failure makes all of them unavailable.

13) Non-transmitting portable electronic device – A portable electronic device that is not equipped with a radio frequency transmitting function or a portable electronic device that has all of the device's radio frequency transmitting functions turned off or is in airplane mode with the transmitting capability also turned off.

14) Operations manual – A manual containing procedures, instructions and guidance for use by operational personnel in the execution of their duties.

15) Operator – The person, organization or enterprise engaged in or offering to engage in an aircraft operation.

16) Passenger – A person who is not an operating crew member.

17) Portable electronic device (PED) – Any lightweight, electrically-powered equipment. These devices are typically consumer electronic devices capable of communication, data processing and/or utility. Examples range from handheld, lightweight electronic devices such as tables, e-readers and smart phones to small devices such as MP3 players and electronic toys.

18) PED interference event – Unusual behavior of on-board electronic systems and equipment that may be suspected as originating from portable electronic device (PED) use. May also be referred to as an electromagnetic interference (EMI) event.

19) Risk mitigation – The process of incorporating defenses, preventive controls or recovery measure to lower the severity and/or likelihood of a hazard's projected consequence.

20) Safety management system (SMS) – A systematic approach to managing safety, including the necessary organizational structure, accountability, responsibilities, policies and procedures.

21) Transmitting portable electronic device (T-PED) – A PED that contains an intentional transmitter, which has some or all of the device's radio frequency transmitting functions turned on. Intentional transmitters may include devices enabled with cellular technology, wireless radio frequency network devices and other wireless-enabled devices such as remote-control equipment (which may include toys), two-way radios, cellular/mobile/smart phones and satellite phones

1.9 ABBREVIATIONS

1)	ACSI	Aircraft Cabin Safety Inspector
2)	CAAP	Civil Aviation Authority of the Philippines
3)	CCOM	Cabin Crew Operations Manual
4)	CCSM	Cabin Crew Safety Manual
5)	E-EFB	Cabin Electronic Flight Bag
6)	EFB	Electronic Flight Bag
7)	HMI	Human-Machine Interface
8)	PED	Portable Electronic Device
9)	STC	Supplemental Type Certificate
10)	TC	Type Certificate

SECTION 2 TYPES & FUNCTIONS

2.1 C-EFB TYPES AND FUNCTIONS

2.1.1 Types of C-EFBs

Portable EFBs are not part of the aircraft configuration and are considered as portable electronic devices (PEDs). They generally have self-sustained power and may rely on data connectivity to achieve full functionality.

Installed EFBs are integrated into the aircraft, subject to normal airworthiness requirements and under design control. The approval of these EFBs is included in the aircraft type certificate (TC) or in the supplemental type certificate (STC).

2.1.2 Functions of C-EFBs.

Both safety and non-safety related functions are eligible as C-EFB functions. A C-EFB may include but not limited to the following functions:

1) cabin crew manuals (i.e., CCOM, CCSM)
2) passenger manifest
3) passenger announcements
4) cabin maintenance log
5) documents and checklists including quick reference handbook
6) reporting forms and functions (mandatory and operator-required reporting, safety, security, quality service, fatigue and flight operations)
7) medical service providers
8) flight and duty limitations
9) training materials and digital learning access
10) operator's email or other news communication
11) operator's portal
12) copy of the C-EFB user manual
13) on-board sales process
14) layover information (e.g., hotel, embassy, doctors, security advices)

The following applications may be considered examples of software applications providing such functions, depending on their use, associated procedures and failure mitigation means:

1) CCOM
2) special authorization/approvals
3) Cabin Maintenance Logbook
4) electronic checklists, including those for normal operations, abnormal and emergency situations
5) mandatory occurrence reporting forms
6) Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods

SECTION 3 HARDWARE

3. HARDWARE

3.1 HARDWARE CONSIDERATIONS FOR INSTALLED C-EFBS

An installed C-EFB is a component incorporated into the aircraft type design and is subject to airworthiness authority approval. Installed C-EFBs should be certified either during the airworthiness certification of the aircraft, through operational bulletins by the original equipment manufacturer or through a third-party STC.

3.2 HARDWARE CONSIDERATIONS FOR PORTABLE C-EFBS

3.2.1 Physical characteristics

Consideration should be given to the physical characteristics of the device selected for the C-EFB (e.g., smartphone or tablet). Some devices may prove to be cumbersome for normal use in the cabin. The physical characteristics of the devices should be evaluated as part of the C-EFB risk assessment.

3.2.2 Stowage and securing

Stowage and securing require inherent means to prevent unwarranted C-EFB movement. Stowage and securing means are required for portable C-EFBs. Stowage and securing should be configured such that the C-EFB can be easily stowed and secured but remains readily accessible. The methods of stowage and securing should not create a hazard during aircraft operations.

3.2.3 Readability

The C-EFB data should be legible under the full range of lighting conditions expected in the cabin. Font, style, color, formatting and background should also be legible. The screen background should be considered in regards to color, wallpaper, etc., to ensure readability.

3.2.4 Basic non-interference facing

Since EFBs are considered as PEDs, the operator should ensure that the C-EFB will not interfere in any way with the operation of aircraft systems.

3.2.5 Power supply, connectivity and compatibility

The operator should ensure that power supply to the C-EFB, either a battery and/or externally supplied power, is compliant with the applicable standards for use in an aircraft and available to the extent required for the intended operation. The power source needs to be suitable for the device. Installed power provisions should comply with the applicable airworthiness requirements. The C-EFB design should consider the source of electrical power, independence of the power sources for multiple C-EFBs and the potential need for an independent battery source. The operator should identify designated outlet/s for use by cabin crew members to charge C-EFBs on board the aircraft. The operator may consider providing approved charging stations for use in flight. If so, the charging stations should meet all the airworthiness requirements. Charging stations that are dedicated for crew use should not be accessible to or used by passengers.

3.2.6 Cabling

The operator should ensure that any cabling attached to the C-EFB, whether the C-EFB is in the dedicated mounting or handheld, does not present a hazard. Cabin crew members should only use approved, compatible devices.

3.2.7 Temperature rise

Rechargeable lithium-type batteries are becoming common as a source of principal power or standby/back-up power in C-EFBs. Lithium-ion or lithium polymer (Lithium-ion polymer) batteries are two types of rechargeable lithium batteries commonly used to power C-EFBs. Overheating can occur during use or charging of the C-EFB. Therefore, the placement of the C-EFB should allow sufficient airflow around the unit.

3.2.8 Data connectivity

The following should be considered with regard to data connectivity:

1) Between C-EFBs, if two or more C-EFBs in the cabin and/or in the flight deck are connected to each other, the operator should demonstrate that this connection does not negatively affect otherwise independent C-EFB platforms and
2) to aircraft system (installed C-EFBs)

3.2.9 Environmental conditions

The operator should ensure that the C-EFB can be operable within the anticipated environmental conditions in the cabin, including foreseeable high or low temperature and after rapid decompression if the C-EFB is intended for use in such an event.

3.3 Mounting devices

A mounting device is a device that can be used to secure a portable C-EFB. It may include docking stations, suction cups, etc. The mounting device may have aircraft power and date connectivity. It may require quick-disconnect for egress. If the mounting device for the C-EFB is permanently attached to the aircraft structure, the installation should be approved in accordance with the appropriate airworthiness requirements. The following guidance may be considered for that purpose:

1) It should be confirmed that the intended C-EFB hardware in its mounting device does not obstruct visual or physical access to aircraft displays, controls or external vision and that the location does not impede egress and emergency escape paths nor pose any risk of injury to occupants (e.g., in the event of a hard landing).
2) There should be no mechanical interference between the C-EFB in its mounting device and any of the cabin display panels.
3) The mounting device should be able to lock in position easily. Crashworthiness considerations should be considered in the design of this device. This includes the appropriate restraint of any device, when in use.
4) A provision should be provided to secure, lock or stow the mounting device in a position out of the way of a cabin crew member operations when not in use.
5) For fire safety reasons, the C-EFB hardware should be capable of being easily removed from the mounting device without tools or maintenance action by cabin crew members.

A suction cup mounted device is not permanently attached to the aircraft structure and therefore does not require aircraft certification approval. EFBs mounted by suction cups are considered as portable EFBs.

SECTION 4 SOFTWARE

4. SOFTWARE

4.1 CONSIDERATIONS FOR ALL C-EFB SOFTWARE APPLICATIONS

4.1.1 Usability

The C-EFB should provide an intuitive, user-friendly and consistent user interface within and across the various software applications that it hosts. This should include, but not limited to, data entry methods, color-coding philosophies and symbols used. Software developers and operators are encouraged to evaluate the usability of an existing human-machine interface (HMI) before developing a new HMI. The HMI should be evaluated for unforeseeable common human errors after its introduction into an operation in the everyday environment to allow for required changes or enhancements of the given design.

4.1.2 Style of presentation

Software considerations include, but are not limited to, the following and should be addressed by the operator:

1) Ease of access to common functions
2) Consistency of symbols
3) Terms and abbreviations
4) Legibility of text
5) System responsiveness
6) Methods of interaction
7) Use of color
8) Display of system status
9) Error messages
10) Management of multiple applications and documents
11) Off-screen text and content
12) Use of active regions

4.1.2.1 Ease of access to common functions

C-EFB software should be designed to minimize cabin crew workload and provide ease of access to common functions. Complex, multi-step date entry tasks should be avoided during critical phases of flight. An evaluation of C-EFB intended functions should include a qualitative assessment of incremental cabin crew workload, as well as user-system interfaces and their safety implications. If a C-EFB is to be used during critical phases of flight, such as during take-off and landing, or during abnormal and emergency situations, its use should be evaluated during simulated or actual aircraft operations under those conditions.

4.1.2.2 Consistency of symbols

Symbols used in the C-EFB application should be consistent with those used on the aircraft systems and equipment and in the paper-based documentation that they are intended to replace.

4.1.2.3 Terms and abbreviations

Terms and abbreviations used in the C-EFB applications should be consistent with those in the paper-based documentation that they are intended to replace.

4.1.2.4 Legibility of text

Information displayed on the C-EFB should be legible to the intended user at the intended viewing distance(s) and under the full range of lighting conditions expected in the cabin including daytime use in direct sunlight and night operation. Brightness should be adjustable in fine increments. Consideration should be given to long-term display degradation because of abrasion and aging of the device.

3.1.2.5 System responsiveness

The system should provide feedback to the user when user input is accepted. If the system is busy with internal tasks that preclude immediate processing of user input (e.g., calculations, self-test or data refresh), the C-EFB should display a "system busy" indicator (e.g., clock icon) to inform the user that the system is occupied and cannot process inputs immediately. The timeliness of system response to user input should be consistent with each application's intended function (e.g., time-critical information should be prioritized by the system).

4.1.2.6 Methods of interaction

In choosing and designing input devices, such as keyboards, touchscreens or curser control devices, the operator should consider the type of entry to be made and the cabin environmental factors, such as turbulence and other normal vibrations affecting the usability of the input device. For touchscreens, cabin crew members may need physical locations or structure (i.e., galley table top) to stabilize their arm, hand and fingers in order to make accurate inputs. The operator should verify that touchscreens do not result in unacceptable levels of cabin crew workload and error rates. Input devices should provide feedback to indicate when they are operational. Since touchscreens provide little of no tactile feedback or control motion, visual and/or aural or other touch activation feedback is especially important. Other touchscreen considerations include selecting the appropriate touch technology (e.g., resistive or capacitive), controlling screen contaminates that may reduce readability (e.g., skin oils and perspiration) and mitigating inadvertent operation.

4.1.2.7 Use of Color

The color "red" should be used only to indicate a warning level condition. "Amber" should be used to indicate a caution level condition. Any other color may be used for items other than warning or cautions, providing that the colors used differ sufficiently from the colors prescribed to avoid possible confusion. The use of colors should take into consideration cabin crew members with color impairments.

4.1.2.8 Display of system status

If an application is fully or partially disabled, or is not visible or accessible to the user, it may be desirable to have an indication of its status available to the user upon request. It may also be desirable to prioritize these C-EFB status and fault messages.

4.1.2.9 Error messages

The C-EFB messages and reminders should be integrated with (or compatible with) other cabin system alerts. The C-EFBs should not cause a distraction through visual or audible notifications. If additional messages are available but not currently displayed, there should be an indication of the additional messages. If user-entered data are not of the correct format or type needed by the application, the C-EFB should not accept the data entry. An error message should be provided that clearly communicates which entry is suspect and specifies what type of data are expected.

4.1.2.10 Management of multiple applications and documents

The C-EFB should provide continuous indication of which application and/or document is active if the system supports multiple open documents or if the system allows multiple open applications. The active application or document is the one currently displayed and responding to user actions. During normal operations, the user should be able to select which of the open applications or documents are running and switch to any one of these open applications easily. The user should also be able to open a new application quickly and easily. When the user returns to an application running in the background, it should appear in the same state as when the user left the application, other than differences associated with the progress or completion of processing performed in the background.

4.1.2.11 Off-screen text and content

If a document segment is not visible in its entirety in the available display area, such as during "zoom" or "pan" operations, the existence of off-screen content should be clearly indicated in a consistent manner. For some intended functions, it may be unacceptable if off-screen content is not indicated. This should be evaluated based on the application and intended operational function.

4.1.2.12 Use of active regions

Active regions are to which special user commands apply (e.g., hyperlinks or copying). The active region can be a text, a graphic image, a window, a frame or another document object. For example, a text string might be selected for copying into search query or a window might be activated in order to bring it to the front of other windows on the screen. Active regions are also useful for selecting between frames on a frame-based visual display.

The information in the active frame would respond to update commands entered by the user. If the display uses active regions, these regions should be clearly indicated. If users do not know how to use an active region, they will have trouble applying special commands to the intended object. If users do not know that a particular region is active, they may enter inappropriate commands and become frustrated when these commands are not processed as expected.

4.2 ELECTRONIC SIGNATURES

In order to be accepted as an equivalent to a handwritten signature, an electronic signature used in C-EFB applications should assure the same degree of accessibility and security as the signature it replaces. The operator should have a process in place for an electronic recordkeeping system to ensure the integrity of the system.

4.3 C-EFB SECURITY

The C-EFB system should be secure from malicious software, data hijack, unauthorized usage and fraudulent or criminal intent both on the ground and in the air. Access to the system should be controlled and authenticated. The operator should ensure that adequate procedures are in place to protect the system software and data. Adequate measures should also be in place for compilation, secure distribution and remote wiping of the data to the C-EFB developed (e.g., device distribution, replacement and collection list, loss, theft, possibility of erasing device content remotely and storage when device is not is use).

4.4 UPDATES

If updates to the C-EFB software are necessary, the operator should ensure that the changes are properly tested in a controlled environment prior to upload for use in flight. This includes updates to the operating system and software data.

The operator should have a process to ensure cabin crew members are informed and have received all system, applications and data updates (e.g., operating systems, tracking systems, notification systems, administrative systems). The C-EFB should have a status page that shows if there are any updates to the C-EFB, if there were any updates performed and these updates entail.

4.5 QUALITY ASSURANCE

The operator should ensure that the software developer has a quality assurance process in place. The software development and verification processes should be included and documented in the quality assurance process.

SECTION 5 C-EFB MANAGEMENT SYSTEM

5.1 GENERAL

The operator should have a C-EFB management system in place for its C-EFB program that include the following:

1) Procedures and systems related to the C-EFB
2) Hardware configuration management
3) Software configuration management
4) C-EFB security
5) Software update management
6) Content management

The C-EFB management system is the key link between the operator and the C-EFB system and software suppliers. It is responsible for hardware and software configuration management and for ensuring that no unauthorized software is installed. The C-EFB management system is also responsible for ensuring that only a valid version of the software application and current data packages are installed in the C-EFB system. The C-EFB management system should ensure that software applications and any updates supporting functions not directly related to operations conducted by cabin crew members on board the aircraft (e.g., web browser, email client, picture management, etc.) do not adversely impact the operation of the C-EFB. There should be a means for the operator to carry out its own check of data content prior to load and release for operational use.

The C-EFB management system should establish procedures to ensure that no unauthorized changes are made to the C-EFB functions. Procedures should be established for the development, maintenance, security and integrity of, and system updates and content downloads to, the C-EFB. The required level of C-EFB security depends on the complexity of the system and data protection. A C-EFB policy and procedures manual may be part of the operator's operations manual. Procedures should be established for the maintenance of the C-EFB.

5.2 DEDICATED PERSONNEL

The operator should assign at least one person (e.g., a dedicated C-EFB manager, a cabin crew manager, etc.) who should maintain oversight of the complete C-EFB system, including distribution of responsibilities within the operator's management structure. Complex C-EFB systems may require additional support.
The operator should ensure that each person involved in the C-EFB management system receives appropriate training in his or her role and has a good working knowledge of the proposed system hardware, operating system and relevant software applications.

5.3 TECHNICAL SUPPORT

The C-EFB management system should also include dedicated technical support for all users. Procedures should include a situation when cabin crew members may need assistance outside the technical support's operating hours. The operator should ensure that cabin crew members have access to necessary information during operations.

5.4 USER MANUAL

The operator should develop a user manual. This manual may be a separate manual in the form of handbook or may be incorporated in the Cabin Crew manuals. The user manual for the C-EFB should contain the following sections, as a minimum:

1) An introduction
2) A table of contents
3) General guidelines (security and confidentiality aspects, actions in the event of lost devices, crew member responsibilities, onboard usage)
4) A manual overview
5) A process for updating and any software pre-requisites
6) Viewing and functionality
7) Search and navigation
8) Design features
9) Information about care (e.g., hardware, cabling converters, device maintenance, damage prevention, etc.)
10) Troubleshooting
11) Frequently asked questions
12) Technical support
13) A process for incorporating CCOM revisions and updates
14) A glossary or an index

SECTION 6 CABIN CREW OPERATING PROCEDURES AND TRAINING

6.1 OPERATING PROCEDURES

The operator should develop procedures for the C-EFB related to the following:

1) The user's roles and responsibilities
2) The phases of flight when the usage of the C-EFB is not permitted
3) Stowage and securing specifications
4) Battery power management
5) Revisions and updates
6) Inclusion of the operator's reporting system and forms, where applicable
7) Damage prevention
8) Loss, damage, theft or software failure
9) Replacement or repair
10) Reporting of C-EFB failures or faults

6.1.1 User's role and responsibilities

The operator procedures should address the individual cabin crew member's role and responsibilities with regard to C-EFB use. These include, but are not limited to, the following:

1) The requirements for the C-EFB availability and accessibility (including minimum number of C-EFBs on board)
2) Usage of the C-EFB during flight
3) Use and download of other or external applications
4) Data protection measures for the device

6.1.2 Phases of flight when the usage of the C-EFB is not permitted

The procedures should include specification of the phases of flight during which cabin crew members may not use the C-EFB, if applicable (e.g., during critical phases of flight, unless required for safety-related tasks).

6.1.3 Stowage and securing specifications

The procedures should include specifications of when and how all portable C-EFBs must be stowed and secured. This includes during critical phases of flight and in turbulence to ensure the safety of the cabin occupants. Secured portable C-EFBs should remain accessible to the cabin crew members throughout the flight.

6.1.4 Battery power management

If battery-powered C-EFB's will utilize aircraft power for recharging the C-EFB battery, the operator should establish a procedure to ensure safe recharge of the battery (e.g., minimum percentage charge of the battery before the flight to be sufficiently charged to support the operation, charging on board, use of a power bank). In addition, the operator should identify designated outlet/s for use by cabin crew members to charge C-EFBs on board the aircraft. Means to operate the power source should be documented per the procedures in the operator's CCOM, including connectivity and compatibility. The operator should also establish procedures to respond to PED or stand-alone lithium battery fires.

6.1.5 Revisions and updates

The operator should have a procedure in place to allow cabin crew members to confirm the revision number and date of C-EFB software applications or databases. Procedures should specify what actions to take if the software applications or databases loaded on the C-EFB are out of date.

6.1.6 Inclusion of the operator's reporting system and forms

If the operator includes its reporting system and forms as part of the C-EFB applications, it should establish procedures regarding their use. This includes mandatory and voluntary reports, as part of the safety management system, including real-time reporting, where applicable.

6.1.7 Damage prevention

The operator should establish procedures for preventing damage to the C-EFBs and to the aircraft. This includes, but is not limited to, guidelines regarding the use of uncertified cabling, crew monitoring of the device while it is charging and exposure to water and temperature.

6.1.8 Loss, damage, theft or software failure

The operator should have procedures in place to address device loss, damage, theft or software failure, particularly to protect the safety and security sensitive information contained in the C-EFB. This should include, but is not limited to:

1) The reporting process (e.g., why, when and how to report to the operator)
2) The device replacement process
3) The backup procedure for software failure or unavailability of the device (e.g., use of hard copies)

6.1.9 Replacement and repair

The operator procedures should address individual cabin crew members' actions and responsibilities with regard to replacing or repairing their assigned C-EFB device.

6.1.10 Reporting of C-EFB failures or faults

A reporting system for C-EFB failures should be established. Procedures should be in place to inform maintenance personnel and cabin crew members about the failure or fault of the C-EFB, including actions to isolate it until corrective action is taken.

6.2 WORKLOAD AND CABIN CREW COORDINATION

In general, using a C-EFB should not increase the crew's workload during critical phases of flight. For other flight phases, cabin crew operating procedures should be designed to mitigate and/or control additional workload created by using a C-EFB. Workload should be distributed between cabin crew members to ensure ease of use and continued monitoring of other cabin crew tasks.

6.3 TRAINING

The type of C-EFB training will depend on the nature and complexity of the C-EFB system. Training should address any gaps in the level of proficiency that the user may have with technology and the specific device to be used. The operator may use different delivery methods for C-EFB training, including classroom instruction, hands-on exercise (to familiarize users with the device) and/or computer- based training (digital learning methods).

Initial C-EFB training should include:

1) The user's role and responsibilities
2) Basics on how to use the C-EFB (e.g., navigating throughout the C-EFB, turning the device and off, logging in and out, adjusting screen settings and brightness, charging the device, screen maintenance, etc.)
3) Information on safe practices (cable removal, usage of protective cases, converter practices, usage of aircraft power outlets, temperature exposure, preservation of long-term battery life, procedure when faced with lithium battery fire, etc.)
4) Clear instruction (e.g., step by step) on how and when to update the C-EFB's content, software, operating system, applications and security as well as the importance of keeping the device up to date
5) Instruction on operating the C-EFB in normal, abnormal and emergency situations
6) The protection of sensitive safety and security information (e.g., passcode security, passenger information, etc.)
7) How to handle and report the failure of C-EFB component/s

The operator should provide additional training for users on any new or modified functions of the device and applications. It may offer supplemental training to maintain and reinforce cabin crew knowledge and proficiency of the C-EFB.

SECTION 7 C-EFB RISK ASSESSMENT

7 C-EFB RISK ASSESSMENT

7.1 GENERAL

The C-EFB risk assessment is a process to evaluate the risks associated with the use of each C-EFB function. The operator should use this process to develop appropriate risk mitigation strategies to manage risks to an acceptable level. The operator should perform a risk assessment prior to the entry into operation of any C-EFB system and the results of the risk assessment should be periodically reviewed.

7.2 RISK ASSESSMENT

The risk assessment should evaluate the risks associated with the use of a C-EFB by addressing the following, as a minimum:

1) Evaluate the physical characteristics of the C-EFB including size (e.g., physical size of the device, screen size, font size), stowage, securing and accessibility (e.g., a C-EFB that is too small may fall behind or under monuments such as class dividers or closets or be obstructed by other items or easily lost)
2) Identify potential losses of function or malfunction (detected and undetected erroneous output) and associated failure scenarios
3) Analyze the operational consequences of these failure scenarios
4) Ensure the C-EFB system (hardware and software) achieves at least the same level of accessibility, usability and reliability as the paper-based system that it is replacing
5) Ensure the C-EFB will not cause interference with the on-board electronic systems and the aircraft equipment on which it will be permitted for use (through aircraft PED tolerability testing)
6) Analyze human factors and ergonomics considerations related to the C-EFB (e.g., to minimize human errors)
7) Establish risk mitigations strategies

When the C-EFB system is intended for introduction alongside a paper-based system, only the failures that would not be mitigated by the use of the paper-based system need to be addressed. In all other cases, a complete risk assessment should be carried out, especially when an accelerated introduction of a new C-EFB system with a reduced transition period.

Manufacturer defects, product recalls and processes for continued operation should be considered in the risk assessment.

The risk assessment should be defined before the beginning of the transition period and should be amended accordingly, if necessary, at the end of the transition period. The results of the transition should establish the configuration and use of the C-EFB system.

7.3 RISK MITIGATION STRATEGIES

Based on the outcome of the C-EFB risk assessment, the operator should determine a series of risk mitigation strategies against C-EFB failure. The operator should consider establishing a reliable alternative means of providing information that is available on the C-EFB system.

The risk mitigation strategies can be one or a combination of the following examples:

1) System design (including hardware and software)
2) Alternative C-EFB, possibly supplied from a different power source
3) Paper backup (e.g., CCOM)
4) Alternative procedures
5) Training
6) Administration support (e.g., the operator should ensure that cabin crew members have access to necessary information during operations)

In order to address the accessibility, usability and reliability of the C-EFB system, the operator should include risk mitigation strategies for failure of the C-EFB system, such as:

1) Complete system failure
2) Individual application failures
3) Corruption or loss of data
4) Battery testing and recharge
5) Erroneously displayed information

7.4 CHANGES TO THE C-EFB

If any updates of the C-EFB are necessary, appropriate testing of the changes should be performed prior to use in flight. For all other types of modification (e.g., hardware) the operator should apply its change management process for the Authority's approval.

SECTION 8 C-EFB EVALUATION PROCESS

8.1 GENERAL

A C-EFB evaluation process is a 5-phased approach employed by CAAP Aircraft Cabin Safety Inspectors (ACSI) when recommending approval of the use and implementation of C-EFB.

8.2 APPROVAL PROCESS

8.2.1 Phase 1 – Pre-Application

During this phase, the Team Leader schedules a Pre-Application Meeting or short briefing with the applicant. He will send a Notice of Meeting to the operator prior to the date of meeting.

During the Pre-Application meeting, the ACSIs and the operator should reach a common understanding of what needs to be evaluated, including:

1) The role of the Authority
2) The applicable requirements
    a) Application Form
    b) Conformance Checklist
    c) Schedule of Events (SOE)
    d) Implementation Plan
    e) Appropriate manuals
3) Transition period (monitoring and documentation)
4) Any actions the operator is responsible for during each phase of the process

8.2.2 Phase 2 – Formal Application

This phase begins when the operator submits an application form and an implementation plan to the Authority for evaluation. The ACSIs should review these documents for completeness and compliance with the regulations.

The operator should submit the following information in the implementation plan, as applicable:

1) C-EFB infrastructure and management plan
2) C-EFB hardware and application specifications
3) C-EFB operator procedures and manual revisions
4) C-EFB training program
5) C-EFB risk assessment
6) Proposed risk mitigation strategies

The operator must choose to keep a paper backup as a means of mitigation against failure when transitioning from paper to electronic format. A paper backup must also be maintained as a mitigation following the full implementation of C-EFBs.

The following should also be taken into account, as part of the plan:

1) The introduction of a new C-EFB program by the operator
2) Changes to an existing C-EFB program, if applicable
3) An existing, approved C-EFB program (e.g., for the flight crew)

4) Previous experience within the CAAP with C-EFB implementation, if applicable

Once the Authority is satisfied with the submitted documents, the operator will follow that plan to produce a complete C-EFB program.

A C-EFB program may be integrated into the Cabin Crew Operations Manual (CCOM) and/or training program or may be presented in a separate manual/handbook.

In addition, during Phase 2, the submission of manual(s) or revisions of manual including the training program and other documents such as requests for instructor or training facilities approval, etc. take place. These documents will go through a review process which is part of Phase 3.

8.2.3 Phase 3 – Document Review

In Phase 3, the Authority will use the Conformance Checklist (submitted by the applicant) to conduct a review of the manual and other documents submitted by the operator.

Interim approval of manual(s) and training program may be issued at this point to start the training of cabin crew.

8.2.4 Phase 4 – Inspection and Demonstration

8.2.4.1 Training

During this phase, the cabin crew training may commence once approval of manual(s) and training program have been issued.

8.2.4.2 Demonstration / practical simulation evaluation

After completing the training, the Authority will require demonstration or practical simulation evaluation(s) of the C-EFB.

Additional evaluation is not required when adding a new C-EFB device to an existing approval unless there is a change in C-EFB functions where the Authority would determine whether an additional evaluation is required.

When a new aircraft is added to an existing C-EFB approval, the suitability of the C-EFB for that aircraft should be addressed. The Authority should examine the technical content and quality of the proposed C-EFB program and other supporting documents and procedures.

8.2.4.3 Transition period

After satisfactory demonstration / practical simulation evaluation(s) of the C-EFB, an interim approval to launch a C-EFB system is issued by the Authority and the operator formally begins the use of the C-EFB combined with paper back-up for a period of three (3) months. This is the start of the transition period, where operational evaluation is conducted by the operator.

The operator should conduct an operational evaluation that verifies all elements have been satisfied. Prior to the conduct of operational evaluation, the operator should notify the Authority of its intention to conduct an operational evaluation. As part of the transition period, a Hazard Identification and Risk Assessment shall also be conducted by the operator.

8.2.4.4 Operational evaluation

The operator should share the operational evaluation results with the Authority. These results will be relevant in the Authority's final decision regarding the implementation of C-EFBs. Final considerations by the Authority should result in one of the following outcomes:

1) Unsatisfactory results. If the Authority finds the proposed C-EFB reliability and/or function to be unacceptable, it should contact the operator for corrective action. C-EFB deficiencies should be corrected and the C-EFB function revalidated prior to approval being issued.
2) Satisfactory results. If the Authority finds the proposed C-EFB reliability and/or function to be acceptable, based on validation data, then the approval may be issued.

8.2.5 Phase 5 - Approval

Prior to issuance of C-EFB Approval, the assigned team will conduct a review of all documents. If all aspects are determined to be complete and satisfactory, a recommendation for approval will be processed.

During this final phase, the Authority grants a C-EFB approval to the operator.

End of Advisory Circular

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Director General

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