Cir 340
AN/198

Guidelines for the Expanded Use of Portable Electronic Devices

Approved by the Secretary General
and published under his authority

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GLOSSARY

Air operator certificate (AOC). A certificate authorizing an operator to carry out specified commercial air transport operations.

Aircraft. Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

Airplane mode. A setting available on many cellular/mobile/smart phones and other electronic devices that, when activated, suspends many of the device's signal transmitting functions, thereby disabling the device's capacity to place or receive calls or use text messaging – while still permitting use of other functions that do not require signal transmission (e.g. games, built-in camera, MP3 player). Airplane mode is also referred to as flight mode, plane safe, or any other non-transmitting mode.

Baggage. Personal property of passengers or crew carried on an aircraft by agreement with the operator.

Cabin crew member. A crew member who performs, in the interest of safety of passengers, duties assigned by the operator or the pilot-in-command of the aircraft, but who shall not act as a flight crew member.

Classroom training. In-person, instructor-led training which may include group exercises and interactive instructional sessions.

Competency. A combination of skills, knowledge and attitudes required to perform a task to the prescribed standard.

Competency element. An action that constitutes a task that has a triggering event and a terminating event that clearly defines its limits, and an observable outcome.

Competency unit. A discrete function consisting of a number of competency elements.

Computer-based training. Training involving instructional aids, such as computers and tablets. Computer-based training may encompass the use of CD-ROMs as well as web-based training (commonly referred to as eLearning).

Crew member. A person assigned by an operator to duty on an aircraft during a flight duty period.

Critical phases of flight. The 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.

Duty. Any task that flight or cabin crew members are required by the operator to perform, including, for example, flight duty, administrative work, training, positioning and standby when it is likely to induce fatigue.

Flight crew member. A licensed crew member charged with duties essential to the operation of an aircraft during a flight duty period.

Foreign operator. Any operator that holds an AOC issued by one State and that operates, or seeks to operate, into the airspace above the territory of another State.

Incident. An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.

> *Note.— The types of incidents that are of interest for safety-related studies include the incidents listed in Annex 13, Attachment C.*

Medical portable electronic device (M-PED). A portable electronic device such as automated external defibrillators (AED), airborne patient medical telemonitoring (APMT) equipment, portable oxygen concentrators (POC), ventilators, respirators, or continuous positive airway pressure (CPAP) machines.

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.

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

Operator. A person, organization or enterprise engaged in or offering to engage in an aircraft operation.

Performance criteria. Simple, evaluative statements on the required outcome of the competency element and a description of the criteria used to judge whether the required level of performance has been achieved.

Pilot-in-command. The pilot designated by the operator, or in the case of general aviation, the owner, as being in command and charged with the safe conduct of a flight.

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 hand held, lightweight electronic devices such as tablets, e-readers, and smart phones to small devices such as MP3 players and electronic toys.

> *Note.— The definition of PED encompasses both transmitting and non-transmitting PEDs.*

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.

Risk mitigation. The process of incorporating defences or preventive controls to lower the severity and/or likelihood of a hazard's projected consequence.

Safety. The state in which risks associated with aviation activities, related to or in direct support of the operation of aircraft, are reduced and controlled to an acceptable level.

Safety management system (SMS). A systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures.

Safety performance. A State's or service provider's safety achievement as defined by its safety performance targets and safety performance indicators.

Safety performance indicator. A data-based safety parameter used for monitoring and assessing safety performance.

Safety risk. The predicted probability and severity of the consequences or outcomes of a hazard.

State of the Operator. The State in which the operator's principal place of business is located or, if there is no such place of business, the operator's permanent residence.

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.

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Chapter 1

INTRODUCTION

1.1   BACKGROUND

1.1.1   In 2013, a number of States began allowing an expanded use of certain portable electronic devices (PEDs) by passengers. "Expanded use of PEDs" refers to the use of devices across all phases of flight, including during critical phases. As a result of this development, other States are considering amending existing regulations to accommodate the expanded use of PEDs across all phases of flight.

1.1.2   The content of this document was developed through a process of consensus, with inputs from experts from civil aviation authorities, airlines, aircraft manufacturers, training organizations, as well as airline and cabin crew representative organizations and was thereafter submitted for an extensive peer review to collect and take into account comments from the expert community. ICAO gratefully acknowledges the contribution received from the ICAO Cabin Safety Group (ICSG) and subject matter experts from the European Aviation Safety Agency (EASA) and the Federal Aviation Administration (FAA).

1.1.3   Prior to allowing the expanded use of PEDs, the State should develop a clear process for the approval/acceptance of changes in policy and procedures by operators, and determine actions that should be taken to maintain or enhance safety, while implementing this change.

1.2   PURPOSE

1.2.1   This circular is intended to provide guidance for States who wish to allow operators to transition to an expanded use of PEDs. For the purpose of this circular, "State" refers to State of the Operator, unless specified otherwise. The circular presents a series of considerations that the State should integrate into the approval/acceptance process, including modifications to regulations and changes in policy and procedures, which should be required of any operator considering or planning to allow the expanded use of PEDs on board its aircraft.

1.2.2   Guidance is also provided to assist operators in implementing the expanded use of PEDs. It addresses the technical considerations associated with aircraft PED tolerability testing, as well as flight operations and cabin safety, crew training and passenger awareness aspects that should be considered as part of the approval/acceptance process.

1.2.3   Furthermore, guidance is provided for post-implementation activities related to on-going surveillance by the State and safety assurance processes by the operator in relation to the expanded use of PEDs.

1.2.4   Additionally, the purpose of the circular is to present an internationally harmonized approach to the implementation of the expanded use of PEDs. In order to promote international harmonization, States are encouraged to incorporate the guidance presented in this circular into their regulations and/or guidance material.

1.3   SCOPE

1.3.1   The content of this circular is presented as guidance material. The outlined approach was developed as an acceptable means, but not the sole means, to allow the expanded use of PEDs. States may also use guidance material

issued by other States to assist with the implementation process. References to such material are provided in Chapter 9 of this circular. Operators should consult specific requirements for the expanded use of PEDs within their State and comply with national regulations, where applicable.

1.3.2   Guidance is limited to the implementation of the expanded use of PEDs by passengers. It focuses on changes that should be made to established regulations, policies, procedures and training programmes. It also addresses issues that need to be considered by the State and the operator as part of the transition process towards expanded use of PEDs across all phases of flight, such as considerations regarding international operations, stowage and securing of PEDs in the cabin, reporting interference and the use of available industry standards (e.g. RTCA or EUROCAE documentation) to safely deal with interference issues. Aspects that should be covered in an existing PED policy (i.e. which prohibits the use of PEDs during critical phases of flight) are not addressed in this circular. Operator procedures related to normal, abnormal and emergency situations that may involve PEDs (e.g. firefighting, turbulence, or evacuation) are outside the scope of this circular. Detailed information on these topics can be found in the *Cabin Crew Safety Training Manual* (Doc 10002).

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Chapter 2

REGULATORY CONSIDERATIONS

2.1   ICAO STANDARDS AND RECOMMENDED PRACTICES (SARPs)

2.1.1   As at 2014, ICAO SARPs did not address the use of PEDs on board commercial passenger aircraft.

2.1.2   Many States' regulations prohibit the use of PEDs during critical phases of flight. Some States allow the expanded use of PEDs while others are considering modifying existing regulations to allow their expanded use. Therefore, there is a need to establish internationally harmonized guidelines for the safe use of PEDs. This chapter provides guidance to States who wish to develop regulations that would allow the expanded use of PEDs and focuses on the rulemaking and oversight responsibilities of the State in this matter.

2.2   REGULATIONS ON PED USE

2.2.1   Currently, many States' regulations permit the unrestricted use of PEDs that the operator has determined will not cause interference with the on-board electronic systems and equipment of the aircraft on which they will be permitted for use (e.g. hearing aids, heart pacemakers, and electric shavers). With the exception of the devices accepted at all times, the operator should be solely responsible for determining which PEDs may be used on board its aircraft during which phase(s) of flight (refer to Chapter 3).

2.2.2   Each operator's PED policy identifies what types of devices may be used on board and during which phase(s) of flight. The operator can mitigate the risks associated with the use of devices by various strategies including, but not limited to, developing and informing crew and passengers about its PED policy.

2.3   REGULATIONS ENABLING THE EXPANDED USE OF PEDs

2.3.1   Both technical and operational aspects must be addressed when implementing an expanded use of PEDs on board during critical phases of flight. When envisaging a regulatory change that would enable the expanded use of PEDs, States should take into account the various areas that will be impacted by the change. These include, but are not limited to:

a)   flight and cabin operations, including changes to operations manuals, policies, procedures, training, and determination of stowage locations on board;

b)   safety information provided to passengers; and

c)   aircraft certification or operator evaluations, to demonstrate on-board electronic systems and equipment tolerance to PEDs.

2.3.2   Sections 2.4 to 2.8 outline the general areas to be addressed when developing regulations that enable the expanded use of PEDs.

2.3.3   When developing regulations to enable the expanded use of PEDs, consideration should be given to jurisdictional issues within the State. In certain cases, the civil aviation authority responsible for aviation rulemaking within the State may be able to modify certain regulations but may not have the authority to modify aspects under another organization's purview.

2.4   TECHNICAL CONDITIONS

The operator should be responsible for determining that PEDs will not cause interference with the on-board electronic systems and equipment of the aircraft on which they are to be used. The following provides examples of acceptable methods of compliance for this regulatory requirement.

     a)   *Operating mode of a PED.* "Airplane mode" turns off all of the transmitters in the device. The operator should continue to require passengers to place their PEDs in "Airplane mode" from the time the aircraft is ready for departure (e.g. door closure, pushback, etc.) until the end of the flight. For aircraft equipped with on-board wireless services, the operator should address the acceptable times during which the passengers may enable their PEDs to transmit in Wi-Fi/Bluetooth mode, when they must be in "Airplane mode" and when they may connect to the wireless services. Aircraft equipped with wireless systems have been tested to ensure that they will not interfere with the on-board electronic systems and equipment. PEDs such as smart phones, some e-readers, cameras and tablets may be operated with transmitters such as Wi-Fi mode through appropriate settings in the device set-up menu.

     b)   *Expanding the use of PEDs.* The State should require the operator to conduct a safety risk assessment prior to implementing a change in policy. This assessment outlines the mitigations and controls that an operator needs to implement in order to expand PED use into various phases of flight. However, the operator can base its equipment-specific safety risk assessment using supporting evidence from previously conducted assessments (e.g. for a specific aircraft model/series). The operator should cover the following items, when conducting a safety risk assessment of typical on-board electronic systems and equipment and their functions to determine potential interference (refer to Chapter 3):

        1)   determine which functions are applicable to the operation;

        2)   establish procedures to adopt the mitigations and controls necessary for those functions. If an operator does not use a function, then no action is necessary;

        3)   evaluate operations to identify unique on-board electronic systems and equipment or functions not covered by this assessment. If any are identified, the operator should review those operations that have major, hazardous or catastrophic failure following the approach established by the assessment and adopt the necessary mitigations and controls for those systems; and

        4)   incorporate the validation concepts into its operation to continuously monitor the impact that expanded use of PEDs may have on an operator's system safety operation (e.g. potential PED interference, if applicable). Refer to Chapter 8 for additional guidance.

2.5   OPERATIONAL CONDITIONS

In addition to the safety risk assessment of on-board electronic systems and equipment, the operator should be required to conduct a safety risk assessment of operational conditions, including cabin safety considerations related to the expanded use of PEDs. These considerations include, but are not limited to stowage requirements for devices, the revision of operator procedures and approved training programmes, and changes in information to passengers. Further guidance on this topic is presented in Chapter 4.

2.6   SPECIAL CONSIDERATIONS

2.6.1   Regulations should enable the prohibition of PED use in certain phases of flight or in special circumstances. These may include, but are not limited to, the following:

   a)   during low visibility operations (e.g. CAT II and CAT III);

   b)   as per pilot-in-command authority;

   c)   during turbulence; and

   d)   during an abnormal or emergency situation – refer to the *Cabin Crew Safety Training Manual* (Doc 10002).

2.6.2   If the operator provides on-board wireless services, it should develop a policy, and associated procedures, accepted by the State. The policy should:

   a)   specify which PEDs may be used for non-voice data services (email, text messaging and internet);

   b)   specify when these PEDs may be used; and

   c)   specify considerations related to the use of Wi-Fi data services for voice communications (e.g. Skype, voice over internet protocol (VoIP), etc.).

2.7   INTERNATIONAL OPERATIONS

2.7.1   Prior to modifying existing regulations to allow the expanded use of PEDs, the State should consider the impact of a regulatory change on national operators operating inbound and outbound international flights. This includes:

   a)   if the State of destination has regulations allowing the expanded use of PEDs which differ from those of the State of the Operator; and

   b)   if the State of destination does not allow the expanded use of PEDs.

2.7.2   If the State of the Operator allows the expanded use of PEDs, but the State of destination does not, the operator should include this aspect in its policy. The operator should have procedures to comply with any restrictions, when applicable.

2.8   REQUIREMENTS FOR IMPLEMENTATION BY THE OPERATOR

2.8.1   As part of the regulatory changes, the State should require operators to address the following, as a minimum:

a)   assess the PED tolerability of the aircraft in their fleet and obtain certification;

b)   conduct a safety risk assessment related to the expanded use of PEDs and develop appropriate mitigation for identified risks;

c)   develop a policy and procedures specific to the expanded use of PEDs;

d)   revise the approved flight and cabin crew training programmes to ensure that crew members are:

   1)   knowledgeable on the policy and procedures related to the expanded use of PEDs;

   2)   aware of their responsibilities in relation to PED usage;

   3)   adequately trained; and

   4)   proficient in the performance of their duties;

e)   provide passengers with supplementary information on the expanded use of PEDs prior to and during the flight; and

f)   monitor and follow up on any potential issues associated with the expanded use of PEDs, as part of their safety management systems.

2.8.2   Refer to Chapters 3 to 8 for detailed guidance on these subjects.

2.9   STATE OVERSIGHT RESPONSIBILITIES RELATED TO THE EXPANDED USE OF PEDs

2.9.1   Acceptance of an operator's proposal for the expanded use of PEDs

2.9.1.1   The State should develop the following, in relation to the expanded use of PEDs:

a)   guidance for use by inspectors when approving the changes;

b)   a documented process for acceptance;

c)   checklists/job aids to support the documented process; and

d)   guidance to the operator on the:

   1)   acceptance process;

2) documents required; and

3) evidence required.

2.9.1.2   As part of the process to enable the expanded use of PEDs, the State should review and accept the proposal presented by the operator, including the safety risk assessment and the implementation plan, and approve the changes related to the following items, using its established processes:

a) policy and procedures;

b) training programmes; and

c) equipment such as on-board wireless service, if applicable.

2.9.2   Continued surveillance

Refer to Chapter 8 for detailed guidance on this subject.

2.9.3   Foreign operators

2.9.3.1   Consideration should be given by the State to foreign operators. Foreign operators are required to comply with their State's regulations. For example, if the foreign operator comes from a State that does not allow the expanded use of PEDs during certain phases of flight (e.g. during taxi-in), this prohibition should be applied when that operator is operating in the State of destination, even if that State of destination allows the expanded use of PEDs (e.g. during taxi-in) for its own national operators.

2.9.3.2   Safety oversight is conducted by the State of the Operator that issued the air operator certificate (AOC). If a State has concerns regarding the expanded use of PEDs by a foreign operator, these should be communicated to the State of that operator for review.

Note.— Detailed guidance on safety oversight responsibilities is contained in the Manual of Procedures for Operations Inspection, Certification and Continued Surveillance *(Doc 8335).*

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Chapter 3

TECHNICAL CONSIDERATIONS

3.1   GENERAL

3.1.1   Policies for allowing use of PEDs originally addressed analysis of individual transmitting and non-transmitting PEDs to determine possible interference. However, the number and variety of PEDs in use today make it impractical to analyze individual devices. Therefore, many assessments are based on the Institute of Electrical and Electronics Engineers (IEEE) standards and the given frequency bands to simulate transmitting PEDs (T-PEDs). This chapter explains how an operator may make the determination based on aircraft type certification data, specific PED tolerance tests, or aircraft operational tests.

3.1.2   States that have regulations governing the use of PEDs on aircraft typically place the responsibility for determining if PED use is acceptable on aircraft operators (refer to Chapter 2). By regulation, the responsibility for permitting use of a particular PED technology lies solely with the operator. The decision to allow use of PEDs is based on determining the potential for PED interference with on-board electronic systems and equipment, especially those required for continued safe flight and landing.

3.2   AVAILABLE INDUSTRY STANDARDS

3.2.1   *RTCA/DO-294.* In March 2003, the FAA requested that the Radio Technical Commission for Aeronautics (RTCA) form a special committee to evaluate and develop guidance to assess the impact and risk related to the use of intentionally radiating PEDs (T-PEDs) that passengers may bring onto civil aircraft. These include mobile phones, computers with wireless network capabilities and other wireless-enabled devices such as personal digital assistants (PDAs). On 19 October 2004, the RTCA released RTCA/DO-294, prepared by Special Committee (SC)-202, and titled "*Guidance on Allowing Transmitting Portable Electronic Devices (T-PEDs) on Aircraft*". This circular references RTCA/DO-294 to include its most current version, RTCA/DO-294C.

3.2.2   *EUROCAE ED-130.* In December 2006, the European Organisation for Civil Aviation Equipment (EUROCAE) released ED-130, prepared by Working Group (WG)-58, titled "*Guidance for the Use of Portable Electronic Devices (PEDs) On Board Aircraft.*" ED-130 provides operational guidance and certification requirements to allow the use of T-PEDs on board aircraft during non-critical phases of flight.

3.2.3   *RTCA/DO-307.* In October 2007, the RTCA released RTCA/DO-307, prepared by SC-202, titled "*Aircraft Design and Certification for Portable Electronic Device Tolerance*". RTCA/DO-307 defines aircraft system and equipment radio frequency (RF) susceptibility qualification recommendations that provide tolerance to RF from intentionally transmitting PEDs. Also, RTCA/DO-307 defines acceptable interference path loss between aircraft radio receivers and spurious RF emissions from transmitting and non-transmitting PEDs. This circular references RTCA/DO-307 to include its most current version, RTCA/DO-307 Change 1.

3.3   AIRCRAFT CERTIFICATION AND AIRWORTHINESS CONSIDERATIONS

3.3.1   In States that have regulations governing the PED tolerance demonstrated by type certification, the aircraft PED tolerance demonstrated by the type certification applicant can help the aircraft operators in their compliance with

State regulations. If the State has regulations for certification of PEDs in their type certification process/requirements, the type certification applicant may submit its data of aircraft PED tolerance in accordance with RTCA/DO-307 for approval by the responsible State regulatory authority. The type certification applicant must reference compliance with aircraft certification and airworthiness requirements (Annex 8 – *Airworthiness of Aircraft*, Part II – *Procedures for Certification and Continuing Airworthiness*, Chapter 1 – *Type Certification*) to demonstrate that the aircraft's equipment, systems, and installations are designed to ensure that they perform their intended functions under any foreseeable operating conditions.

3.3.2   The type certification applicant may demonstrate aircraft PED tolerance to spurious emissions (Section 4 of RTCA/DO-307), intentional transmissions (Section 3 of RTCA/DO-307), or both.

3.3.3   The Airplane/Rotorcraft Flight Manual (or Supplement) should provide appropriate instructions regarding the PED tolerance approval of the aircraft (see Section 5 of RTCA/DO-307). Any continued airworthiness instructions required to maintain the level of tolerance should be specified in the instructions for continuing airworthiness (see Section 5.7 of RTCA/DO-307).

   Note.— Guidance equivalent to that in RTCA/DO-307 is presented in EUROCAE ED-130.

3.3.4   Documentation of PED tolerance approval may also be accomplished by service bulletin, service letter or other documentation acceptable to the State of the Operator.

3.4   OPERATIONAL CONSIDERATIONS

3.4.1   RTCA/DO-294 or EUROCAE ED-130 identify processes for evaluating acceptable use of transmitting PEDs, particularly when considering specific types of transmitting PEDs. The operator may want to obtain the services of a person or facility capable of determining non-interference to the on-board electronic systems and equipment. Personnel specifically designated by the operator for this purpose may make this determination using the process described in RTCA/DO-294 or EUROCAE ED-130.

3.4.2   RTCA/DO-307 defines methods to demonstrate that an aircraft model is tolerant to transmitting and non-transmitting PEDs. RTCA/DO-307 is most easily applied by aircraft manufacturers that have access to data that defines the on-board electronic systems and equipment qualification and the aircraft radio receiver antenna installations, but the methods in RTCA/DO-307 can be used by operators. RTCA/DO-307 has separate methods for demonstrating tolerance to intentional transmissions from transmitting PEDs and demonstrating tolerance to spurious emissions from PEDs. If an aircraft model has demonstrated tolerance for both transmitting and non-transmitting PEDs, the operator may allow PED use during all phases of flight on these aircraft models.

3.4.3   If an operator does not have a PED-tolerant aircraft and chooses not to test its aircraft fleet types according to DO-307 or ED-130, then the operator may choose to conduct a safety risk assessment using the guidance in Chapter 4 of this circular. The operator must assess the on-board electronic systems configuration of its fleet and the failure modes associated with different types of equipment with respect to electromagnetic interference. This assessment outlines mitigations and controls that the operator needs to adopt to expand PED use into various phases of flight. Refer to Chapter 9 for resources on how States have implemented processes and procedures for performing the safety risk assessment and mitigation.

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Chapter 4

OPERATOR SAFETY RISK ASSESSMENT

4.1   SAFETY RISK ASSESSMENT IN THE EXPANDED USE OF PEDs

ICAO Annex 19 — *Safety Management* requires an operator to have a safety management system (SMS). In order for a State to consider allowing an operator to permit the expanded use of PEDs on board its aircraft, the operator should use a safety risk assessment process, based on SMS principles, to demonstrate to the State that the modified policy and procedures for the use of PEDs provide an acceptable level of safety performance.

> *Note.— This chapter provides an overview of safety risk assessments. Detailed guidance on SMS and conducting safety risk assessments is presented in the* Safety Management Manual *(Doc 9859).*

4.2   OVERVIEW OF THE SAFETY RISK MANAGEMENT PROCESS

4.2.1   As part of an SMS, the operator should ensure that safety risks encountered in aviation activities are controlled in order to achieve an acceptable level of safety performance. This process is known as safety risk management. It includes hazard identification, safety risk assessment, and the implementation of appropriate mitigation strategies. The safety risk management process is illustrated in Figure 1.

4.2.2   Hazard identification is a formal process developed and maintained by the operator to identify hazards that may contribute to aviation safety-related occurrences. A number of conditions may trigger the need for a more in-depth hazard identification process to identify risks and appropriate mitigation actions. These may include:

  a) instances where the organization experiences an unexplained increase in aviation safety-related events or regulatory non-compliance;

  b) significant operational changes, including anticipated changes to key personnel or other major system components; and

  c) significant organizational changes, including anticipated growth/contraction, corporate mergers or acquisitions.

4.3   STEP 1: IDENTIFYING THE HAZARDS ASSOCIATED WITH THE EXPANDED USE OF PEDs

4.3.1   As part of the operator's process for permitting the expanded use of PEDs, it should demonstrate to the State that hazard identification has been conducted, in accordance with its established processes.

4.3.2   Each hazard can generate one or many consequences, and each consequence can be assessed as one or many safety risks. The first step in the process is hazard identification, then the safety risk assessment of potential consequences. When the operator develops procedures regarding the expanded use of PEDs, the identified hazards and their consequences must be considered, with the goal of determining potential issues associated with the anticipated policy change.

4.3.3   Table 1 presents examples of hazards and potential consequences associated with the expanded use of PEDs. The operator should conduct its own hazard identification exercise, including potential consequences, as a first step in the safety risk management process.
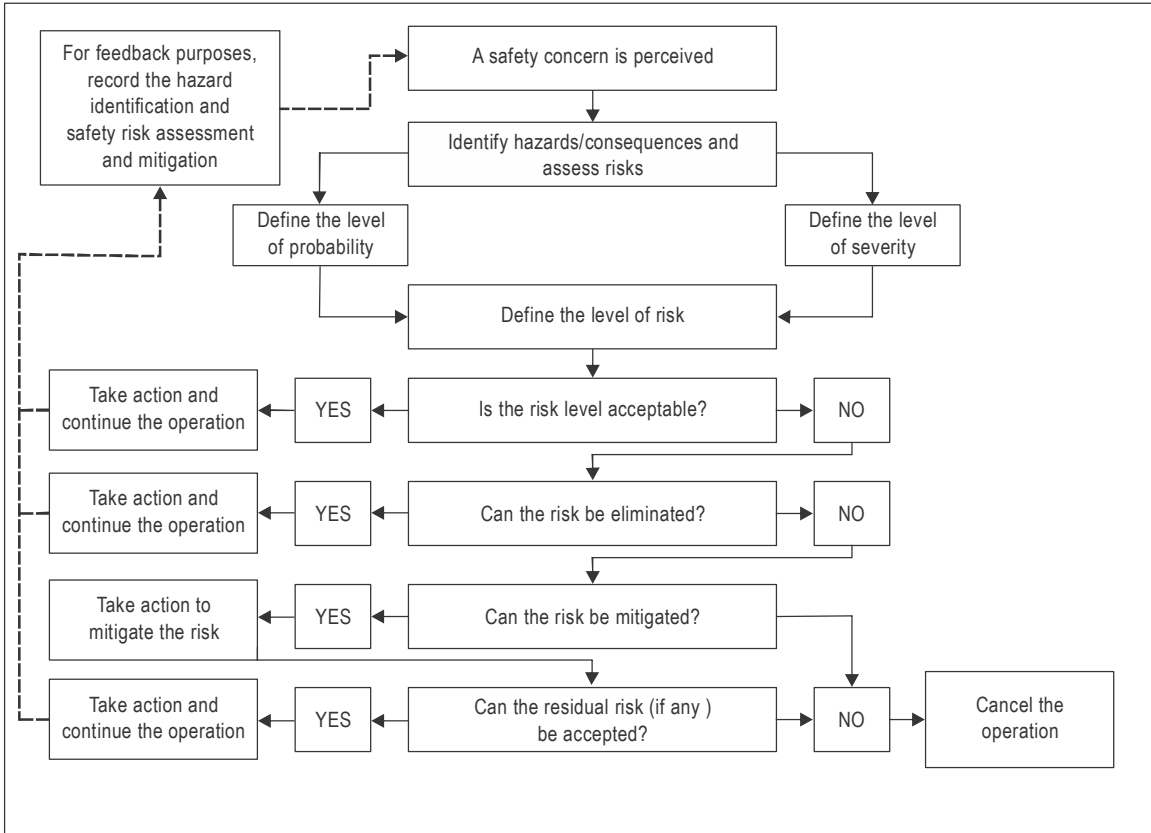

Figure 1.   Safety risk management process[1]

Table 1.   Examples of hazards and potential consequences associated with the expanded use of PEDs

Generic hazard: PED use permitted during all phases of flight	
Specific components of the hazard	**Hazard-related consequences**
Policy variations regarding the use of PEDs associated with State regulations and interlining operators (e.g. on international flights)	Unintentional passenger non-compliance with specific policy Unruly passengers Increased cabin crew workload Interference with on-board electronic systems and equipment
Policy variations regarding the use of PEDs associated with the operator's fleet/aircraft types (e.g. the operator's policy allows expanded use allowed on B777 but not on A330 fleet)	Unintentional passenger non-compliance with specific policy Unruly passengers Confusion for cabin crew members when determining fleet/aircraft specific policy Interference with on-board electronic systems and equipment
Improperly stowed/secured PEDs during take-off and landing	Injury to occupants if PEDs become loose and/or projectile Impeded evacuation PEDs being crushed in passenger seats
PED or lithium battery malfunction	Battery overheat/fire Damage to aircraft cabin, from fire Injury to occupants, due to fire/smoke/fumes
PED and/or headset use during passenger safety briefings	Failure to listen to/hear safety announcements/briefings Passengers not aware of safety information in the event of emergency; inability to respond appropriately in an emergency situation
Crew workload	Loss of situational awareness and ineffective crew member response
Passengers using PEDs during an abnormal or emergency situation or during an evacuation	Passengers not aware of safety information Reduced situational awareness for passengers Impeded/delayed evacuation
PED use during low visibility operations	Interference with on-board electronic systems and equipment Passenger non-compliance with request to shut off PED Injury to cabin crew members from standing during a critical phase of flight, while attempting to identify the PED suspected of causing interference Increase in crew workload at a time of high workload

4.4   STEP 2: ASSESSING SAFETY RISKS ASSOCIATED WITH
THE EXPANDED USE OF PEDS

4.4.1   As a second step, the operator should assess all safety risks associated with the identified consequences related to the expanded use of PEDs. The assessment of safety risks is expressed in terms of predicted probability and severity of the consequence(s) of a hazard, taking as reference the worst foreseeable situation.

4.4.2   Safety risks which are assessed as acceptable require no action to bring or keep the probability and/or severity of the consequences of hazards under organizational control. If the safety risks are assessed as intolerable, the following questions become relevant:

   a)   Can the hazards and related safety risk(s) be eliminated? If the answer is yes, then action as appropriate is taken and documented. If the answer is no, the next question is:

   b)   Can the safety risk(s) be mitigated? If the answer is no, related activities must be cancelled. If the answer is yes, mitigation action as appropriate is taken and the next question is:

   c)   Do any residual safety risks exist? If the answer is yes, then the residual risks must be assessed to determine their level of tolerability as well as whether they can be eliminated or mitigated as necessary to ensure an acceptable level of safety performance.

4.5   STEP 3: DEVELOPING SAFETY RISK MITIGATION STRATEGIES
TO ENABLE THE EXPANDED USE OF PEDS

4.5.1   As the third step, the operator should develop safety risk mitigation strategies to address the identified safety risks. These strategies should be specific to each hazard and take into account the following:

   a)   hazard/consequence identification and safety risk assessment;

   b)   assessment of the defenses within the safety system;

   c)   control and mitigation of the risk(s);

   d)   acceptance of the mitigation of the risk(s):

      1)   Does it address the risk(s)?

         i)   Is it appropriate?

         ii)   Is it effective?

   e)   determination of additional or different mitigation warranted; and

   f)   assessment of additional risk(s) generated by the mitigation strategies.

4.5.2   Post-implementation activities should be conducted in accordance with the guidelines included in Chapter 8.

4.6   EXAMPLE OF A SAFETY RISK MANAGEMENT PROCESS

4.6.1   Table 2 presents an example of a safety risk management process, specific to the expanded use of PEDs. As part of the process, specific components of the generic hazard (in this case, allowing the use of PEDs during all phases of flight) should be identified. For each specific component of the hazard, the operator should clearly identify consequences. As part of the safety risk assessment, existing defenses (if applicable) should be identified. Existing defenses should be assessed to determine how they help mitigate the risk(s) associated with each consequence. If further action is needed, the follow-up action should be identified (e.g. revise procedures) and the risk re-assessed. Finally, each action should be clearly assigned to a person within the organization, who will be responsible for its implementation (e.g. the manager of cabin safety will modify existing procedures in the Operations Manual).

4.6.2   As part of the approval/acceptance process, the State should be satisfied with the safety risk assessment prior to allowing the operator to implement policy changes regarding the use of PEDs.

Table 2.   Example of a safety risk management process

Type of operation or activity		*Generic hazard*	*Specific components of the hazard*
Flight/cabin operations		PED use permitted during taxi-out	Improperly stowed and secured devices during take-off
Hazard-related consequences	*Existing defenses to control risk(s) and risk index*	*Further action to reduce risk(s) and resulting risk index*	*Responsible person*
Injury to occupants	Passenger safety briefing *Risk tolerability: Unacceptable under the existing circumstances*	Include proper securing and stowing of devices in safety briefing *Risk tolerability: Acceptable after review of the operation*	Manager of cabin safety
	Cabin checks by crew *Risk tolerability: Unacceptable under the existing circumstances*	Revise procedures regarding cabin checks and specify appropriate securing and stowage of PEDs *Risk tolerability: Acceptable after review of the operation*	Manager of cabin safety

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Chapter 5

OPERATOR POLICY AND PROCEDURES

5.1 DEVELOPMENT OF A POLICY AND PROCEDURES ON THE EXPANDED USE OF PEDs

5.1.1   As part of the approval process, the operator seeking to allow the expanded use of PEDs on board its aircraft should develop a policy to safely implement the change. The operator should also describe crew duties and responsibilities related to the expanded use of PEDs and establish the necessary procedures in its operations manual. As part of the process, these procedures should be reviewed by the competent authority when approving the operations manual.

5.1.2   It is the operator's responsibility, in line with its SMS, to conduct a safety risk assessment to determine means to mitigate any potential safety-related risks associated with the expanded use of PEDs (refer to Chapter 4). The established policy and procedures should address the issues identified in the safety risk assessment.

5.2 POLICY ON THE EXPANDED USE OF PEDs

5.2.1   The operator should establish a policy that allows the expanded use of PEDs without adversely affecting operational safety. The goal of this policy is to instil a common understanding among passengers and the operator's personnel regarding the expanded use of devices, including which PEDs are permitted and how they should be handled while passengers are on board the operator's aircraft.

5.2.2   The following aspects should be included in the policy:

   a)   types of devices accepted by the operator on board its aircraft;

   b)   restrictions/prohibitions of PED use;

   c)   specific considerations and/or restrictions regarding certain device capabilities, such as text messaging and voice communications;

   d)   stowage and securing of devices, especially during critical phases of flight;

   e)   specific aspects related to the use of crew members' personal PEDs and operator-issued PEDs, if applicable (refer to 5.7);

   f)   crew reporting and investigation of occurrences or anomalies associated with PED use, including but not limited to, passenger behaviour disruption, suspected or confirmed PED interference, and PED or stand-alone battery failure that produced smoke or fire or resulted in abnormal or emergency situations (refer to Chapter 8); and

   g)   the charging of a PED using aircraft power during critical phases of flight.

5.2.4   Details related to the policy are presented in 5.3 to 5.7 of this chapter.

5.3   TYPES OF PEDs ALLOWED BY THE OPERATOR

5.3.1   The operator should define the types of PEDs that it allows passengers to use on board its aircraft. These should be defined in broad categories and may include, but are not limited to, the following:

       a)   cellular/mobile/smart phones;

       b)   e-readers;

       c)   medical portable electronic devices;

       d)   tablets;

       e)   personal digital assistants (PDAs);

       f)   laptop computers;

       g)   gaming devices (e.g. electronic games and toys);

       h)   wearable technology;

       i)   global positioning system (GPS) devices;

       j)   MP3 players;

       k)   bluetooth enabled devices; and

       l)   Wi-Fi enabled devices.

5.4   RESTRICTIONS/PROHIBITIONS

5.4.1   The operator's policy should clearly state when the use of PEDs may be restricted or prohibited. The policy may restrict or prohibit the expanded use of PEDs when it can compromise the safety of flight. For example, the in-flight use of any devices that have the potential to interfere with on-board electronic systems and equipment should be prohibited.

5.4.2   The policy should address phases of flight when PED use is permitted, restricted or prohibited, specifically noting any differences in the policy for ground and pre-flight operations, pushback and taxi, take-off, climb, cruise, descent and approach, and landing, as well as post-landing and post-flight operations (including transit).

5.4.3   If the State of the Operator allows the expanded use of PEDs, but the State of destination does not, the operator should include this aspect in its policy. The operator should have procedures to comply with any restrictions, when applicable.

5.4.4   Some States prohibit the use of PEDs during refuelling. If this is the case, the operator's policy should include prohibiting the use of PEDs by crew members and passengers during refuelling. If the State does not prohibit the use of PEDs during refuelling, the operator may consider restricting aspects of the use of PEDs during refuelling, through its policy.

5.5   TEXT MESSAGING AND VOICE COMMUNICATIONS

5.5.1   As part of the policy, the operator should address the use of text and other messaging services (e.g. "sms" and "mms") and mobile phone calls on board aircraft, including possible restrictions. The policy should also address the use of PED transmitting functions (e.g. enabling "airplane mode").

5.5.2   If the operator provides on-board wireless services, the policy should:

a)   specify which PEDs may be used for non-voice data services (email, text messaging and internet) and when; and

b)   specify aspects related to the use of Wi-Fi data services for voice communications (e.g. Skype, VoIP, etc.).

5.6   STOWAGE AND SECURING OF PEDs

5.6.1   There is an important distinction between stowing and securing PEDs. If a PED is "stowed", it must be placed into an approved stowage location on board the aircraft. These locations have been designed and certified to comply with the requirements for retention of articles of mass. Approved stowage locations have specific weight and size limitations. When a PED is "secured", it is restrained by a method which may not have been certified for retention of articles of mass.

5.6.2   During take-off and landing and other critical phases of flight, the operator should have a policy and procedures addressing the following:

a)   a larger PED article (such as a laptop computer) should be stowed in a location that is certified for retention (e.g. an overhead bin);

b)   a smaller hand-held PED (such as a mobile phone or tablet) should be "secured" (i.e. not loose) during surface movement, take-off, descent, approach and landing. Passengers should secure smaller PEDs on their person by means acceptable to the State. Passengers may also secure small PEDs by placing them in the seat pocket. PEDs should not be left unsecured in an adjacent empty seat or lying on the lap of a passenger;

c)   the policy should address the use of seat pockets for securing PEDs. Seats are generally tested with seat back pockets holding a maximum of three pounds (approximately 1.36 kg). The passenger safety briefing card, magazines and other literature, and air-sickness bag account for approximately one pound (approximately 0.45 kg). When the operator conducts a safety risk assessment to determine an acceptable weight limit for the seat pocket, these items should be taken into account; and

d)   the policy should prohibit passengers from getting up out of their seats to access the overhead bins or other stowage areas when this may present a risk to themselves or the passengers around them, such as during critical phases of flight and at other times identified by the operator.

5.7   CREW MEMBERS' PERSONAL AND OPERATOR-ISSUED PEDs

5.7.1   The operator should include in its policy specific guidelines on the use of personal PEDs by flight and cabin crew members during duty, including when such use is prohibited.

5.7.2   The operator should also include in its policy specific guidelines on the use of operator-issued PEDs, such as tablets that are used by flight and cabin crew members to conduct their duties, if applicable, or distributed to passengers as part of the operator's in-flight entertainment. The use of operator-issued PEDs may be subject to additional regulatory requirements, as per national regulations. Therefore, this issue is outside the scope of this circular.

5.8   PROCEDURES RELATED TO EXPANDED USE OF PEDs

5.8.1   The operator should revise procedures in its operations manual. Procedures related to passenger use of PEDs should be amended to include aspects specific to the expanded use of PEDs during normal, abnormal and emergency situations.

5.8.2   Normal operations procedures for cabin crew members should be revised to verify that they include the following:

  a)   *stowage and securing of devices*. The operator's procedures should define proper stowing and securing of PEDs. Cabin crew members should verify passenger compliance with the operator's policy and procedures when securing and checking the cabin;

  b)   *use of prohibited PEDs*. Cabin crew members should monitor the cabin to check that prohibited PEDs are not in use during the flight;

  c)   *aircraft fitted with wireless services*. In addition to the policy for the use of wireless services, the operator should develop specific procedures regarding their use. These procedures may include shutdown of the system in the event of any abnormal or emergency situation;

  d)   *procedures in the event of turbulence*. The operator should verify existing turbulence procedures to ensure that they include considerations on the use, stowage and securing of PEDs, as well as the associated cabin crew announcements and cabin checks;

  e)   *use of PEDs during refuelling*. Certain States prohibit the use of PEDs during refuelling, while others allow it. If the State prohibits the use of PEDs during refuelling, this should be reflected in the operator's procedures. These procedures should include informing passengers (e.g. by means of passenger announcements) that the use of PEDs is prohibited while the aircraft is being refuelled, as well as verification by cabin crew members that devices are not in use;

  f)   procedures for the use, stowage and securing of operator-issued PEDs for crew and/or passengers, if applicable, including phases of flight and stowage locations; and

  g)   procedures related to the charging of a PED using aircraft power during critical phases of flight.

5.8.5   Abnormal and emergency procedures for cabin crew members should be revised to verify that they include the following:

  a)   reporting, coordinating, and managing response to suspected or confirmed PED interference events, including transient or intermittent problems (refer to 5.9);

  b)   *fires related to PEDs or stand-alone lithium batteries*. The increase in quantities and use of PEDs increases the probability of an on-board fire originating from these devices. Lithium battery fires differ from other types of fires and require specific crew responses to manage them. The operator should verify that its fire-fighting procedures address specific aspects for dealing with PED fire/smoke occurrences, including how cabin crew should handle and stow affected devices. Detailed guidance

on procedures in case of fire involving a PED or stand-alone lithium batteries can be found in the *Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods* (Doc 9481); and

c) *passenger management.* Passengers who do not adhere to the operator's policy regarding the expanded use of PEDs may fall under established policies and procedures for the management of unruly passengers. The operator may include passenger issues related to PED use in its examples of unruly behaviour, if this subject is not already covered as part of unruly passenger management procedures.

5.9   REPORTING INTERFERENCE

5.9.1   In accordance with regulatory requirements, if interference from a PED is suspected, the operator should have established procedures to terminate the operation of PEDs suspected of causing interference with on-board electronic systems and equipment.

5.9.2   Where interference with on-board electronic systems and equipment is suspected from use of a PED, cabin crew members should:

a)   instruct passenger(s) to terminate the use of PED(s);

b)   confirm with flight crew members that use of PEDs has been terminated;

c)   if interference has ceased, no further immediate action is needed except continued monitoring of the situation for possible re-occurrence of interference;

d)   if interference has not ceased, cabin crew members should check for passengers' compliance with further instructions to discontinue using devices/turn off devices;

e)   prohibit the use of PED(s) suspected of creating interference;

f)   verify the status of the on-board electronic systems and equipment with flight crew members; and

g)   once device(s) has been identified, communicate with the flight crew members on use of non-suspect PEDs for the remainder of the flight.

5.9.3   The pilot-in-command should report incidents of suspected PED interference and include the following information in the report:

a)   *flight information.* Aircraft type, registration date and UTC time of incident, aircraft location (VOR bearing/DIST/LAT/LONG), altitude, weather conditions, pilot name and telephone number;

b)   *description of interference.* Description of effects on flight deck indicators, audio or on-board electronic systems and equipment, including radio frequency, identification, duration, severity and other pertinent information;

c)   *crew response.* Action taken by the flight crew/cabin crew members to identify cause or source of interference;

d)   *identification of PED.* Description of device, brand name, model, serial number, mode of operation, device location (seat location), and regulatory approval number (FCC, IMEI (International Mobile Equipment Identity) or any other type of certification);

e)   *identification of user.* Name and telephone number of passenger operating the device; and

f)   *additional information*. As determined pertinent by the crew.

5.10   SAFETY INFORMATION TO PASSENGERS

5.10.1   The pre-flight passenger safety demonstration is important for providing information to passengers on the safety aspects of the flight and demonstrating the use of safety and emergency equipment and aircraft systems. Distractions caused by use of PEDs during the safety demonstration should be avoided so that passengers can focus their attention on the safety briefing and crew instructions. As part of its procedures, the operator should emphasize the importance of passengers paying attention to the safety demonstration and encourage them to focus on the briefing and cabin crew instructions. The operator may consider restricting the use of PEDs during the safety demonstration (e.g. by means of a passenger announcement). The operator's policy and procedures should also take into account PED-related passenger distractions for other briefings such as emergency exit row briefings and the preparation of the cabin for an emergency landing.

5.10.2   If the operator allows the expanded use of PEDs, the following information should be communicated to passengers prior to departure:

a)   a concise summary of the policy regarding PED use (e.g. the use of PEDs is permitted across all phases of the flight);

b)   overview of devices allowed during the flight;

c)   times when devices may and may not be used;

d)   special instructions regarding text messaging and voice communications (e.g. if mobile phone calls are prohibited throughout the flight);

e)   proper stowing and securing of devices and times when this should be done; and

f)   the importance of complying with all crew member instructions at all times.

5.10.3   Additionally, the following information should be included in the passenger safety information card:

a)   prohibited types of PEDs;

b)   restrictions on use according to phase of flight (e.g. pictorial depicting prohibition of PED use for take-off/landing or prohibition of voice communications); and

c)   permitted stowage location(s) for PEDs.

Chapter 6

TRAINING

6.1 REVISION OF TRAINING PROGRAMMES

6.1.1 The operator's policy and procedures related to the use of PEDs should be addressed during crew training. Guidance on cabin crew training regarding the use of PEDs can be found in the *Cabin Crew Safety Training Manual* (Doc 10002), Chapter 5 – *Normal operations training*. Additionally, training should address the application of procedures in case of fire involving a PED or stand-alone lithium batteries. Guidance on this topic can be found in Doc 10002, Chapter 7 – *Dangerous goods training*.

6.1.2 The training content should be reviewed by the State when approving the operator's training programme. As part of the process to allow the expanded use of PEDs, the operator should modify its approved training programme to ensure it addresses policy changes and specific procedures regarding crew member duties and responsibilities. The revised training should focus on the changes in the policy and procedures that accompany the expanded use of PEDs.

6.1.3 This chapter provides a list of key elements that, if not currently covered, should be addressed in the operator's training programme in order to safely implement the expanded use of PEDs. The State may consider it acceptable that the operator provides written notification or other methods of communication that it normally uses to convey urgent information, as an interim method until the training programmes can be revised. When deciding to implement the expanded use of PEDs, the operator should consider the benefits of early communications to its flight and cabin crew members regarding upcoming changes.

6.2 CREW TRAINING

The operator should define the content to be included in the approved flight and cabin crew training programmes. The operator's policy and procedures related to the use of PEDs should be included in all relevant training for flight and cabin crew. In addition, the operator should update flight and cabin crew members of any changes to the policy and/or procedures related to PEDs.

6.3 COMPETENCY-BASED APPROACH TO CREW TRAINING AND ASSESSMENT

6.3.1 The *Procedures for Air Navigation Services — Training* (PANS-TRG, Doc 9868) outlines the general principles and procedures to be followed in the design and implementation of a competency-based approach to training and assessment. It outlines the key features and describes how the competency-based approach is to be used by training programme developers, instructors, and examiners. Additionally, the *Cabin Crew Safety Training Manual* (Doc 10002) presents cabin crew safety training using a competency-based approach. It provides guidance for operators to develop cabin crew competency-based training.

6.3.2   The content in this chapter is not linked to specific competency elements found in the ICAO competency frameworks for flight and cabin crew members. However, to ensure consistency with the two documents referenced in 6.3.1, this chapter is written in the same format as the existing ICAO guidance material which addresses specific competency elements. It provides guidance on the following:

   a)   performance criteria;

   b)   recommended conditions under which the training should be conducted (e.g. classroom-based training versus hands-on exercises);

   c)   reference material that is relevant during the training;

   d)   recommended performance standard used to verify that the performance criteria are met; and

   e)   recommended knowledge that the trainees should demonstrate.

6.4   FLIGHT CREW INITIAL TRAINING

6.4.1   Flight crew initial training should include, but is not limited to, the following:

   a)   changes to the operator's policy, how to interpret and apply them; and

   b)   flight crew duties and responsibilities related to suspected or confirmed PED interference.

6.4.2   Detailed guidance on flight crew training is presented in 6.5 to 6.6.

6.5   CHANGES TO THE OPERATOR'S POLICY

6.5.1   *Performance criteria*

         Apply the operator's revised PED policy.

6.5.2   *Conditions*

         Classroom or computer-based training.

6.5.3   *Reference*

         Operations manual.

6.5.4   *Performance standard*

         Describe the revised PED policy, its objectives and how it relates to crew members' duties and responsibilities as individuals in the organization.

6.5.5   *Knowledge*

a)   Definition of PEDs, including examples of the various device types available and typical indications for operating modes (transmitting and non-transmitting); and

b)   the operator's revised PED policy, how to interpret it, and list of exceptions.

6.6   SUSPECTED OR CONFIRMED PED INTERFERENCE

6.6.1   *Performance criteria*

Apply procedures for handling suspected PED interference and follow-up actions.

6.6.2   *Conditions*

Classroom or computer-based training.

6.6.3   *Reference*

Operations manual.

6.6.4   *Performance standard*

Describe procedures for handling and reporting suspected PED interference and follow-up actions.

6.6.5   *Knowledge*

a)   The potential impact on on-board electronic systems and equipment from use of PEDs, including the potential hazards to flight safety associated with these devices;

b)   means to identify suspected PED interference (transient and intermittent), relay pertinent information to cabin crew members and the actions necessary to resolve suspected PED interference; and

c)   procedures for handling and reporting suspected PED interference, as per operator procedures.

6.7   CABIN CREW INITIAL TRAINING

6.7.1   The *Cabin Crew Safety Training Manual* (Doc 10002) presents specific cabin crew competency units and elements, several of which address the use of PEDs and the application of associated operator policies and procedures. The content in this chapter is not linked to a specific competency unit or element described in Doc 10002. This circular addresses policies and procedures in which cabin crew should be knowledgeable, in order to perform specific duties and responsibilities in relation to the expanded use of PEDs.

6.7.2   Cabin crew initial training should include, but is not limited to, the following:

a) changes to the operator's policy and how to interpret and apply its objectives (refer to 6.5.);

b) changes in procedures on the use, stowage and securing of PEDs (refer to 6.8);

c) cabin crew duties and responsibilities related to suspected or confirmed PED interference (refer to 6.6); and

d) passenger management (refer to 6.9).

6.8   CHANGES IN CABIN CREW PROCEDURES

6.8.1   *Performance criteria*

Apply the operator's revised procedures on the use, stowage and securing of PEDs.

6.8.2   *Conditions*

Classroom or computer-based training.

6.8.3   *Reference*

Operations manual.

6.8.4   *Performance standard*

Describe the operator's revised procedures on the use, stowage and securing of PEDs.

6.8.5   *Knowledge*

a) Policy and procedures on the use, stowage and securing of PEDs, both for passengers and cabin crew members;

b) the importance of visually checking the approved PED stowage areas prior to passenger boarding and reporting any discrepancies;

c) the importance of monitoring PEDs during charging cycle (for both crew and passenger devices), if the cabin is fitted with electrical outlets;

d) the safety hazards associated with passenger use of headsets during boarding, the safety demonstration, critical phases of flight, disembarkation, while walking across an open apron and during abnormal and emergency situations; and

e) the safety hazards associated with corded devices connected to a PED or into the electrical and or cabin's in-flight entertainment system (IFE).

6.9   PASSENGER MANAGEMENT

Passengers who fail to comply with the operator's PED policy may be classified as unruly. Guidance on cabin crew training for managing unruly passengers is contained in Doc 10002, *Cabin Crew Safety Training Manual*, Chapter 10 – *Aviation Security Training*.

6.10   RECURRENT TRAINING

The content of flight and cabin crew recurrent training should include, but is not limited to, the following, if applicable:

   a)   changes to the operator's PED policy and procedures;

   b)   review of recent occurrences related to expanded use of PEDs; and

   c)   recent developments in PED technology that crew members may encounter on board.

6.11   STATE INSPECTOR AWARENESS

6.11.1   As part of its oversight responsibilities related to expanded PED use, the State of the Operator may need to approve changes in the operator's programme and documentation (operations manual, training, etc.), and monitor aspects related to the expanded use of PEDs during scheduled, on-going surveillance activities.

6.11.2   The State should conduct an awareness programme for its designated inspectors, to provide them with the knowledge needed to carry out their assigned oversight responsibilities. Similarly to the requirements for operators, the State should define the content to be included in the inspectors' awareness programme.

6.11.3   The content of an inspector's awareness programme may include, but is not limited to, the following:

   a)   general overview of the expanded use of PEDs:

      1)   definition of PEDs, including the various types of devices that may be encountered and how to correlate these to the operator's PED policy; within each technology class, examples of the various device types available and typical indications for operating modes (transmitting and non-transmitting);

      2)   awareness of ICAO recommendations regarding the expanded use of PEDs;

      3)   awareness of international and national regulations related to the expanded use of PEDs; and

      4)   awareness of occurrences related to expanded use of PEDs, internationally and within own State specifically;

   b)   familiarity with the operator's flight and cabin crew safety training programmes and operations manual(s), with regard to the normal, abnormal and emergency procedures related to PEDs;

   c)   knowledge of the recommended changes to the content of the operator's policy and procedures related to the expanded use of PEDs (e.g. if specified in an advisory circular or staff instruction issued by the State);

d) awareness of the safety hazards associated with the expanded use of PEDs, and recommended mitigation measures;

e) awareness of passenger management issues related to the expanded use of PEDs; and

f) familiarity with the operator's reporting procedures for occurrences related to PED use, including suspected or confirmed PED interference events.

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Chapter 7

PASSENGER AWARENESS

7.1 IMPORTANCE OF RAISING PASSENGER AWARENESS

7.1.1 As part of the transition process, the State should pay special attention to raising passenger awareness regarding the expanded use of PEDs. The operator should convey information to passengers on the new policy, any safety implications of expanded PED use and any passenger responsibilities associated with the provision of this service.

7.1.2 In order to promote a continued safe operating environment, precise and clear information should be given to passengers regarding the types of PEDs that can and cannot be used during various phases of the flight, the requirement to secure and stow devices during certain phases of flights and PED size and weight limitations.

7.1.3 The operator should provide information that is easy to understand, concise, and widely disseminated through various forms of media to ensure that it is clearly understood and accepted. Without standardized, consistent messages from the operator and the State, passenger non-compliance related to the expanded use of PEDs may increase.

7.2 THE STATE AND OPERATOR'S ROLE IN PASSENGER AWARENESS

7.2.1 Disseminating information to passengers on the expanded use of PEDs is a joint effort between States and operators. Although the operator is ultimately responsible to ensure that appropriate information is provided to its passengers, the State can also contribute by developing an awareness campaign that may be communicated to the travelling public by different means, such as the State's website.

7.2.2 Press releases, information pamphlets, and web pages with frequently asked questions are all examples of ways to convey a uniform message to passengers when allowing the expanded use of PEDs. Well-coordinated dissemination of information is an integral part of the process and will facilitate the appropriate use of devices by the travelling public.

7.3 DEFINING THE KEY MESSAGES

7.3.1 The State should define key messages for passengers, to raise awareness on the importance of the safety-related aspects of expanded PED use during various phases of flight. This may be done in collaboration with operators.

7.3.2 Key messages should include, but are not limited to, the following:

a) the requirement for passengers to comply with the operator's policy and procedures pertaining to the expanded use of PEDs;

b) the types of PEDs that can and cannot be used during various phases of flight;

c) PED capabilities that can and cannot be used (GPS, Wi-Fi, voice communications, etc.);

d)   how and when PEDs (corded and cordless) must be secured or stowed, including weight limitations;

e)   potential hazards associated with improper securing or stowage of PEDs (e.g. injury to others);

f)   compliance with crew member instructions;

g)   the importance of paying attention during the passenger safety briefings;

h)   changes to the operator's carry-on baggage programme, if applicable;

i)   varying policies amongst States and/or operators, which may result in restrictions in the use of certain PEDs; and

j)   PED use by crew members (e.g. electronic manuals) may differ from what is permitted for passengers, during certain phases of flight.

7.4   METHODS USED FOR DISSEMINATION OF INFORMATION

Multiple means should be used to convey information to passengers regarding the expanded use of PEDs. These may include, but are not limited to, the following:

a)   organization's website (State and operator);

b)   television and radio advertisements;

c)   social media;

d)   travel agencies;

e)   tickets;

f)   text messages;

g)   counter and web check-in;

h)   announcements at the boarding gate;

i)   pre-flight safety announcements;

j)   passenger safety briefing;

k)   pre-landing safety announcements;

l)   in-flight entertainment system;

m) in-flight magazine; and

n)   posters at airports.

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Chapter 8

POST-IMPLEMENTATION ACTIVITIES

8.1   STATE ON-GOING SURVEILLANCE ACTIVITIES

8.1.1   The State should require the operator to monitor hazards associated with the expanded use of PEDs through the established safety assurance processes of an SMS. As part of its on-going surveillance activities, the State should gather data and reports to verify that the operator follows up on any safety risks associated with the expanded use of PEDs, any occurrences (e.g. a PED interference event) and/or any findings resulting from oversight activities.

8.1.2   After the implementation of the expanded use of PEDs, and as per the State's established reporting requirements, the State should require the operator to:

   a)   report accidents and incidents related to the expanded use of PEDs;

   b)   record and retain hazard and occurrence reports and make them available to the State upon request or inspection; and

   c)   monitor the effectiveness of corrective actions.

8.1.3   The State should encourage voluntary reporting of safety-related events pertaining to the expanded use of PEDs.

8.1.4   In the interest of aviation safety, States may share aggregated, de-identified information related to PED occurrences with other relevant stakeholders (e.g. other States, manufacturers, operators, etc.).

   Note.— Safety data collection, analysis and exchange should be in accordance with Annex 19 – Safety Management*, Chapter 5.*

8.2   OPERATOR SAFETY ASSURANCE PROCESS

8.2.1   The safety risk management process allows the operator to identify, analyze, assess and control the safety risks associated with identified hazards, as part of its SMS. The safety risk management process may result in the establishment of mitigation strategies.

8.2.2   Once mitigation strategies have been approved and implemented, any associated impact on safety performance should be directed to the operator's safety assurance process. Safety assurance must be considered as a continuous, on-going activity aimed at:

   a)   ensuring that the initial identification of hazards and assumptions in relation to the assessment of the consequences of safety risks, and the mitigation strategies that exist in the system as a means of control, remain valid and applicable over time; and/or

   b)   introducing changes in the mitigation strategies, as applicable to existing and/or new risks.

8.3   CREW REPORTING AND INVESTIGATION

8.3.1   The operator should abide by State directives in relation to the safety assurance process, promote voluntary reporting of hazards and occurrences from crew members and provide corrective action(s), if necessary. Additionally, the operator should continue to monitor PED-related occurrences and, if applicable, collect data to assess the effectiveness of the established mitigation strategies.

8.3.2   As part of the operator's SMS, crew members should report hazards and occurrences through existing reporting processes. The following occurrences should be reported and investigated, if applicable, for follow-up action by the operator:

   a)   suspected PED interference with on-board electronic systems and equipment;

   b)   security concerns related to expanded use of PEDs; and

   c)   safety concerns related to expanded use of PEDs, including but not limited to:

      1)   non-compliance with regulatory requirements;

      2)   non-compliance with operator policies (e.g. stowage issues, failure to comply with crew member instructions, etc.);

      3)   fire/smoke occurrences caused by PEDs; and

      4)   evacuation process, as related to PEDs.

8.4   CONTINUED SURVEILLANCE

As a follow-up to the initial approval/acceptance, the State should include aspects related to the expanded use of PEDs as part of its continued surveillance activities of the operator. These include, but are not limited to, the following:

   a)   inspections/surveillance activities by the State;

   b)   identification of non-compliance(s);

   c)   resolution of issues/corrective action(s);

   d)   enforcement action, if applicable; and

   e)   voluntary reporting.

8.5   ENFORCEMENT ACTION

The State should have an established process for enforcement of compliance with applicable rules and regulations. If the operator violates regulations regarding the expanded use of PEDs, or fails to accomplish the necessary corrective action(s) within a reasonable time, the established process for enforcement action should be followed, as with any other issue.

    Note.— Detailed guidance on SMS and safety assurance is contained in the Safety Management Manual *(Doc 9859). Detailed guidance on State surveillance activities is contained in the* Manual of Procedures for Operations Inspection, Certification and Continued Surveillance *(Doc 8335).*

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Chapter 9

ADDITIONAL RESOURCES

9.1   EXISTING GUIDANCE MATERIAL

This chapter presents existing guidance material developed by States, which can be used to support the implementation of the expanded use of PEDs. The documents cited in this chapter can be found in the ICAO Cabin Safety Library, on the Organization's website: www.icao.int/cabinsafety

9.2   FAA GUIDANCE

9.2.1   In 2013, the Federal Aviation Administration (FAA) determined that operators can safely expand passenger use of PEDs during all phases of flight. The decision was based on input from the PED Aviation Rulemaking Committee (ARC) which concluded that most commercial aircraft can tolerate radio interference signals from PEDs.

9.2.2   In order to support implementation, the FAA developed guidance material, which includes the following documents:

a)   InFO 13010 – *Expanding Use of Passenger PED*;

b)   InFO 13010 SUP – *FAA Aid to Operators for the Expanded Use of PEDs*; and

c)   Notice 8900.240 – *National Policy, Expanded Use of PEDs*.

9.2.3   The FAA developed a dedicated website on the expanded use of PEDs. The documentation can be obtained from the website: http://www.faa.gov/about/initiatives/ped and on the ICAO website.

9.3   EASA GUIDANCE

9.3.1   The European Aviation Safety Agency (EASA) published guidance which allows the expanded use of PEDs across all phases of flight. The aim of the Agency is to ensure safe and harmonized use of PEDs on board aircraft operated by European operators. EASA documentation includes the following, which can be obtained from the Agency's website at www.easa.europa.eu/document-library/agency-decisions:

a)   Decision 2014/029/R for Part-CAT;

b)   Decision 2014/030/R for Part-NCC;

c)   Decision 2014/031/R for Part-NCO; and

d)   Decision 2014/032/R for Part-SPO.

9.3.2   EASA also developed a dedicated website on the expanded use of PEDs: www.easa.europa.eu/easa-and-you/passenger-experience/portable-electronic-devices-ped-board.

9.4   GUIDANCE BY OTHER STATES

Other States have published guidance on the expanded use of PEDs. This guidance includes, but is not limited to, the following:

a)   Australia: CASA AWB 23-003 – *Aid to Operators for the Expanded Use of Passenger PEDs*;

b)   Canada: TCCA AC 700-005 – *Use of Transmitting and Non-Transmitting Portable Electronic Devices*;

c)   Singapore: CAAS AC AOC-7(4) – *Use of Portable Electronic Devices On board Aircraft*;

d)   United Arab Emirates: AMC to CAR OPS – 1.110 – Portable Electronic Devices; and

e)   United Kingdom: CAA Information Notice IN–2014/022 – *Use of Portable Electronic Devices during Commercial Air Transport Aircraft Operation*.

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