

aircraft in order to welcome passengers and adjust their seat belts with the rotors turning.

- (c) Rotor engagement for the purpose of maintenance: the Implementing Rule, however, does not prevent ground runs being conducted by qualified personnel other than pilots for maintenance purposes.

The following conditions should be applied:

- (1) the operator should ensure that the qualification of personnel, other than pilots, who are authorised to conduct maintenance runs is described in the appropriate manual;
- (2) ground runs should not include taxiing the helicopter;
- (3) there should be no passengers on board; and
- (4) maintenance runs should not include collective increase or autopilot engagement (due to the risk of ground resonance).

AMC1 CAT.GEN.MPA.135(a)(3) Admission to the flight crew compartment

INSTRUCTIONS FOR SINGLE-PILOT OPERATIONS UNDER VFR BY DAY

Where an aircraft is used in a single-pilot operation under visual flight rules (VFR) by day but has more than one pilot station, the instructions of the operator may permit passengers to be carried in the unoccupied pilot seat(s), provided that the commander is satisfied that:

- (a) it will not cause distraction or interference with the operation of the flight; and
- (b) the passenger occupying a pilot seat is familiar with the relevant restrictions and safety procedures.

AMC1 CAT.GEN.MPA.140 Portable electronic devices

GENERAL

- (a) Scope

This AMC provides means to prevent that portable electronic devices (PEDs) on board aircraft adversely affect the performance of the aircraft's systems and equipment. This AMC addresses operation of PEDs in the different aircraft zones – passenger compartment, flight compartment, and cargo compartments. Furthermore, it addresses the specific case of PEDs qualified and under configuration control by the operator - controlled PEDs (C-PEDs) - for which the operator gives some credit.

- (b) Restrictions on the use of PEDs in the passenger compartment

If an operator permits passengers to use PEDs on board its aircraft, procedures should be in place to control their use. The operator should ensure that all crew members and ground personnel are trained to enforce the restrictions on this equipment in line with these procedures.

These procedures should ensure the following:

- (1) As the general principle all PEDs (including transmitting PEDs (T-PEDs)) are switched-off at the start of the flight when the passengers have boarded and all doors have been closed, until a passenger door has been opened at the end of the flight.
- (2) The following exceptions from the general principle may be granted under the responsibility of the operator:
 - (i) Medical equipment necessary to support physiological functions does not need to be switched-off.
 - (ii) The use of PEDs, excluding T-PEDs, may be permitted during non-critical phases of flight, excluding taxiing.
 - (iii) T-PEDs may be used during non-critical phases of flight, excluding taxiing, if the aircraft is equipped with a system or otherwise certified allowing the operation of such technology during flight. The restrictions coming from the corresponding aircraft certification as documented in the aircraft flight manual (AFM), or equivalent document(s), stay in force.
 - (iv) The use of C-PEDs during critical phases of flight, however, may only be permitted if the operator has accounted for this situation in its assessment.
 - (v) The commander may permit the use of any kind of PED when the aircraft is stationary during prolonged departure delays, provided that sufficient time is available to check the passenger compartment before the flight proceeds. Similarly, after landing, the commander may authorise the use of any kind of PED in the event of a prolonged delay for a parking/gate position (even though doors are closed and the engines are running).
- (3) Announcements should be made during boarding of the aircraft to inform passengers of the restrictions applicable to PEDs (in particular to T-PEDs) before fastening their seat belts.
- (4) Where in-seat electrical power supplies are available for passenger use the following should apply:
 - (i) information cards giving safety instructions are provided to the passengers;
 - (ii) PEDs should be disconnected from any in-seat electrical power supply, switched-off and stowed during taxiing, take-off, approach, landing, and during abnormal or emergency conditions; and
 - (iii) flight crew and cabin crew should be aware of the proper means to switch-off in-seat power supplies used for PEDs.
- (5) During boarding and any phase of flight:

- (i) appropriate coordination between flight crew and cabin crew is defined to deal with interference or other safety problems associated with PEDs;
 - (ii) passenger use of equipment during the flight is monitored;
 - (iii) suspect equipment is switched off; and
 - (iv) particular attention is given to passenger misuse of equipment that could include a built-in transmitting function.
- (6) Thermal runaways of batteries, in particular lithium batteries, and potential resulting fire can be handled properly.
- (7) Appropriate coordination between flight crew and cabin crew should be defined to deal with interference or other safety problems associated with PEDs.
- (8) The commander may for any reason and during any phase of flight require deactivation and stowage of PEDs.
- (9) Occurrences of suspected or confirmed interference that have potential safety implications should be reported to the competent authority. Where possible, to assist follow-up and technical investigation, reports should describe the offending device, identify the brand name and model number, its location in the aircraft at the time of the occurrence, interference symptoms and the results of actions taken by the crew.

The cooperation of the device owner should be sought by obtaining contact details.

- (10) Special requests to operate a PED or T-PED during any phase of the flight for specific reasons (e.g. for security measures) should be handled properly.

(c) Restrictions on the use of PEDs in the flight compartment

Due to the higher risk of interference and potential for distracting crew from their duties, PEDs should not be used in the flight compartment. However, the operator may allow the use of PEDs, e.g. to assist the flight crew in their duties, if procedures are in place to ensure the following:

- (1) The conditions for the use of PEDs in-flight are specified in the operations manual, otherwise they should be switched off and stowed during all phases of flight.
- (2) The PEDs do not pose a loose-item risk or other hazard.
- (3) During critical phases of flight only those C-PEDs are operated, for which the operator has demonstrated that the radio frequency (RF) interference levels are below those considered acceptable for the specific aircraft environment. Guidance for such test is provided in (e) below.
- (4) During pre-flight procedures, e.g. when loading route information into navigation systems or when monitoring fuel loading, no T-PED should be operated. In all other cases, flight crew and other persons on board the aircraft involved in dispatching the aircraft should observe the same restrictions as applicable to passengers.

(5) These restrictions should not preclude use of a T-PED (specifically a mobile phone) by the flight crew to deal with an emergency. However, reliance should not be predicated on a T-PED for this purpose.

(d) PEDs not accessible during the flight

PEDs should be switched off, when not accessible for deactivation during flight. This should apply especially to PEDs contained in baggage or transported as part of the cargo. The operator may allow deviation for PEDs for which tests have demonstrated their safe operation. Other precautions, such as transporting in shielded, metal boxes, may also be used to mitigate associated risks.

In case an automated function is used to deactivate a T-PED, the unit should be qualified for safe operation on board the aircraft.

(e) Test methods

The means to demonstrate that the RF radiations (intentional or non-intentional) are tolerated by aircraft systems should be as follows:

- (1) The radio frequency (RF) emissions of PEDs should meet the levels as defined by EUROCAE ED-14E/RTCA DO 160E Section 21 Category M for operation in the passenger compartment and EUROCAE ED-14E/RTCA DO 160E Section 21 Category H for operation in the cargo bay. Later revisions of those documents may be used for testing. The assessment of intentional transmissions of T-PEDs is excluded from those test standards and needs to be addressed separately.
- (2) When the operator intends to allow the operation of T-PEDs, its assessment should follow the principles set out in EUROCAE ED-130.

GM1 CAT.GEN.MPA.140 Portable electronic devices

DEFINITIONS

(a) Definition and categories of PEDs

PEDs are any kind of electronic device, typically but not limited to consumer electronics, brought on board the aircraft by crew members, passengers, or as part of the cargo and that are not included in the approved aircraft configuration. All equipment that is able to consume electrical energy falls under this definition. The electrical energy can be provided from internal sources as batteries (chargeable or non-rechargeable) or the devices may also be connected to specific aircraft power sources.

PEDs fall into three categories:

- (1) Non-intentional transmitters can non-intentionally radiate RF transmissions. This category includes, but is not limited to, computing equipment, cameras, radio receivers, audio and video reproducers, electronic games and toys. In addition, portable, non-transmitting devices provided to assist crew members in their duties are included in this category. The category is identified as PED.
- (2) Intentional transmitters can radiate RF transmissions on specific frequencies as part of their intended function. In addition they may radiate non-intentional

transmissions like any PED. The term 'transmitting PED' (T-PED) is used to identify the transmitting capability of the PED. Intentional transmitters are transmitting devices such as RF based remote control equipment, which may include some toys, two-way radios (sometimes referred to as private mobile radio), mobile phones of any type, satellite phones, computer with mobile phone data connection, wireless fidelity (WIFI) or Bluetooth capability. After deactivation of the transmitting capability, e.g. by activating the so-called 'flight mode' or 'flight safety mode', the T-PED remains a PED having non-intentional emissions.

- (3) A controlled PED (C-PED) is subject to administrative control by the operator. This will include, inter alia, tracking the location of the devices to specific aircraft or persons and ensuring that no unauthorised changes are made to the hardware, software or databases. A controlled PED will also be subject to procedures to ensure that it is maintained to the latest amendment state. C-PEDs can be assigned to the category of non-intentional transmitters (PEDs) or intentional transmitters (T-PEDs).

(b) Definition of the switched-off status

Many PEDs are not completely disconnected from the internal power source when switched off. The switching function may leave some remaining functionality e.g. data storage, timer, clock, etc. These devices can be considered switched off when in the deactivated status. The same applies for devices having no transmit capability and operated by coin cells without further deactivation capability, e.g. wrist watches.

GM2 CAT.GEN.MPA.140 Portable electronic devices

FIRE CAUSED BY PEDs

A detailed discussion of fire caused by PEDs can be found in CAA UK CAP 789 edition 2, chapter 31, section 6 *Fires in the cabin caused by PEDs*² and CAA PAPER 2003/4, *Dealing With In-Flight Lithium Battery Fires in Portable Electronic Devices*, M.J. Lain, D.A. Teagle, J. Cullen, V. Dass³.

AMC1 CAT.GEN.MPA.145 Information on emergency and survival equipment carried

ITEMS FOR COMMUNICATION TO THE RESCUE COORDINATION CENTRE

The information, compiled in a list, should include, as applicable, the number, colour and type of life-rafts and pyrotechnics, details of emergency medical supplies, e.g. first-aid kits, emergency medical kits, water supplies and the type and frequencies of emergency portable radio equipment.

² <http://www.caa.co.uk/docs/33/CAP%20789.pdf>.

³ http://www.caa.co.uk/docs/33/CAPAP2003_04.PDF.