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AIC

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USE OF PORTABLE ELECTRONIC DEVICES ON BOARD AIRCRAFT

Background

The purpose of this AIC is to update the guidance to aircraft owners and operators provided in previous Irish Aviation Authority Circulars AIC Nr 17/00 and AIC Nr 17/93 concerning the use of Portable Electronic Devices (PEDs) on board aircraft.

PEDs in the context of this AIC are any commercially available electronic devices which may be carried on board an aircraft by crews or passengers and which when switched on emit electromagnetic radiation, either intentionally (i.e. transmitting devices) or unintentionally as a by-product of its operation (i.e. non-transmitting devices). The safety concern is that these PEDs present a risk of adverse interference to aircraft systems, and there is much evidence available in the industry (Reference 4, 5, 8) to show that this interference can occur. Intentionally transmitting PED's present a greater risk to aircraft systems than unintentionally transmitting PEDs, but nevertheless aircraft owners and operators must develop policies and procedures to deal with both these risks appropriately.

In the past operators adopted a policy of not allowing any PEDs to be operated during flight by passengers, however the availability of PEDs to the public has grown significantly in the past decade, as is the demand by aircraft passengers to be allowed to use these devices on board aircraft. Commercial operators are required under JAR OPS 1.110 or 3.110 (as applicable) to ensure that no person on board an aircraft uses a PED which can adversely affect the performance of aircraft systems. This AIC provides guidance to aircraft owners and operators to assist them in developing their policy and procedures for controlling the use of PEDs on aircraft.

Overview of PEDs

PEDs are considered to fall into two main categories, intentional and unintentional transmitters. Due to the rapid evolutionary nature of these devices it is not possible to provide a definitive list of examples of PEDs which will stand the test of time, however the following lists may be used as an example of the types of devices applicable to the two categories:

1. Intentionally transmitting PEDs include but are not limited to:
 - a. Cellphones (cellular, portable, mobile),
 - b. PC/PDA/Games with cellular network devices (e.g. with resident or plug in GSM, Smartphone, Blueberry, Blackberry, or similar)

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- c. PC/PDA/Games with wireless local or personal area network (including WiFi - WLAN/WPAN or similar)
 - d. Satellite phones
 - e. Radio transmitters (incl two way radios/pagers)
 - f. Remote controlled devices, including toys
2. Unintentionally transmitting devices include but are not limited to:
- a. PC/PDA equipment without transmitting devices
 - b. Electronic games and toys without transmitting devices
 - c. Electronic cameras, except those embedded in cellphones
 - d. Audio and video reproducers
 - e. Radio receivers
 - f. Electrical shavers
 - g. PC/PDA/Games with Bluetooth may be treated as a non-intentional transmitter (Reference 8, 9)

Certain medical devices (e.g. hearing aids, heart pacemakers etc) although technically categorised as unintentional transmitting devices are considered sufficiently low risk devices to be excluded from this AIC.

Recommended Procedures

If an aircraft owner or operator permits passengers to use PEDs on board its aircraft, procedures will need to be in place to control their use. The following procedures are recommended, based on a common operational policy contained in current guidance provided from JAA and FAA sources (Reference 2, 3) as well as studies from RTCA and EUROCAE (Reference 6, 7, 8). Aircraft owners and operators can find additional information on this subject in these referenced documents.

Intentionally Transmitting Devices

In order to control the use of intentionally transmitting PEDs on aircraft the aircraft owner or operator should adopt the following procedures, based on the policy that the use of these devices should not be permitted during flight:

- Ensure that all intentionally transmitting devices are switched off prior to closing aircraft passenger doors before start of flight. These devices must remain off until the aircraft passenger doors are opened again at the end of flight.
- Ensure that the passenger is advised of this policy by;
 - Briefings and/or announcements to passengers during check-in to ensure that intentionally transmitting PEDs placed in baggage are switched off
 - Announcements during boarding to ensure passengers have sufficient time to verify that intentional transmitting PEDs are switched off
 - Announcements after landing to ensure passengers keep intentional transmitting PEDs switched off until after the passenger doors are opened
- Flight and cabin crew procedures and training must reflect the same policy
- Ensure that cabin crew procedures and training are sufficient to facilitate robust monitoring of the cabin during flight to ensure that this policy is adhered to by all passengers. In this regard, cabin crew training must address the ability of the crew to recognise intentionally transmitting PED's (especially PC/PDA/Games with integrated transmitters) and to keep up with the technology as and when these devices evolve.
- Caution should be exercised if the use of intentionally transmitting PEDs which claim to have 'plane safe' or 'flight safe' functions is to be allowed in flight. The premise is that

the transmitters can be de-activated so as to allow the device to be treated as an unintentionally transmitting PED. The aircraft owner/operator remains responsible for ensuring that such devices do not interfere with aircraft systems when in 'plane/flight safe' mode. In addition cabin crew procedures and training must address the particular difficulties in monitoring the use of such devices during flight.

- This policy does not prevent any aircraft owner or operator from permitting the use of any particular intentional transmitting PEDs for which the operator has obtained approval from the relevant authority responsible for operational oversight. Such an approval would only be granted following a robust certification programme similar to that required for the aircraft systems themselves. The RTCA has provided guidance for operators who wish to qualify such intentionally transmitting devices (Reference 7).

Unintentionally transmitting Devices

In order to control the use of unintentionally transmitting PEDs on aircraft, the aircraft owner or operator should adopt the following procedures, based on the policy that the use of these devices should not be permitted during critical flight phases:

- Ensure that all PEDs are switched off, fully disconnected from any in-seat electrical power supply and properly stowed for taxi, take-off, approach, landing, and during abnormal or emergency conditions.
- Ensure that the passenger is advised of this policy by;
 - Announcements during boarding to ensure passengers have sufficient time to switch off and properly stow these PEDs until after take-off
 - Announcements during flight to ensure that the passengers have sufficient time to switch off, disconnect and stow the PEDs prior to the approach.
- Flight and cabin crew procedures and training must reflect the same policy

General

Aircraft owners and operators should anticipate that despite their best efforts to the contrary anomalies may occur in flight due to the use of PEDs by passengers (or crew) and therefore should have procedures in place to deal with such events. These procedures should include:

- Flight crew procedures and training to be alert for possible anomalies due to PEDs
- Communications procedures between flight and cabin crews to quickly identify and switch off the offending PED should such an anomaly occur.
- Reporting procedures to identify precisely the nature of the anomaly, phase of flight, the make/model of PED involved, location of the PED on the aircraft etc. The passenger should be encouraged to provide contact details for follow-up investigation if he is willing to do so.
- Serious anomalies should be reported to the relevant authority responsible for operational oversight.

References

1. JAR OPS 1/3.110: *Portable Electronic Devices*.
2. JAA TGL (JAR OPS) Leaflet No. 29: *Guidance concerning the use of Portable Electronic Devices on board aircraft*, June 2001.
3. FAA Advisory Circular AC 91.21-1A; *Use of Portable Electronic Devices aboard Aircraft*; 2nd October 2000.
4. UK Civil Aviation Authority: *Interference Levels In Aircraft at Radio Frequencies used by Portable Telephones*; report 9/40:23-90-02, May 2nd, 2000.

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5. UK Civil Aviation Authority CAA Paper 2003/3; *Effects of Interference from Cellular Telephones on Aircraft Avionic Equipment*
 6. RTCA Inc: *Portable Electronic Devices carried on board Aircraft*; document DO-233, August 20th, 1996.
 7. RTCA Inc: Guidance on allowing Transmitting Portable Electronic Devices (T-PEDs) on aircraft; document DO-294, August 19th, 2004.
 8. EUROCAE: *Report on electromagnetic compatibility between passenger carried Portable Electronic Devices (PEDs) and aircraft systems*; document ED-118, November 2003.
 9. Intel Mobile Architecture Lab Technology & Research Labs: *Safety Evaluation of Bluetooth Class ISM Band Transmitters on board Commercial Aircraft*; Revision 2, December 2000.

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