



WORKING PAPER

ASSEMBLY — 37TH SESSION

TECHNICAL COMMISSION

Agenda Item 46: Other issues to be considered by the Technical Commission

STANDARDS FOR THE USE OF PORTABLE ELECTRONIC DEVICES IN AIRCRAFT

(Presented by the Republic of Korea)

EXECUTIVE SUMMARY

There is a growing concern about the electromagnetic interference generated by portable electronic devices (PEDs) used by passengers affecting the aircraft systems; however, there are no ICAO Standards and Recommended Practices (SARPs), guidelines or rules harmonized amongst States relating to the use of PEDs on board yet.

Action: The Assembly is invited to:

- a) note the information presented in this working paper;
- b) share experiences in studies on electromagnetic interference;
- c) agree that ICAO should establish requirements for the PED restriction; and
- d) encourage ICAO to develop a guideline for the global harmonization of the regulations regarding the use of the PEDs.

<i>Strategic Objectives:</i>	This working paper relates to Strategic Objective A: Safety – <i>Enhance global civil aviation safety</i>
<i>Financial implications:</i>	N/A
<i>References:</i>	Doc 9376, <i>Preparation of an Operations Manual</i>

1. INTRODUCTION

1.1 With higher dependence on complicated and sophisticated electronic devices, the use of electronic devices equipped with wireless communication capabilities by air passengers is growing and concerns about the electromagnetic interference caused by these devices used on board are considerably increasing.

1.2 Previous studies and related statistical data show that the use of the PEDs during flight may result in safety problems, because of the PED interference with aircraft electronic systems.

1.3 In the Republic of Korea (ROK), some airlines reported in-flight anomaly events in the electronic systems just before landing or take-off. It is presumed that these events were caused by the use of the PEDs on board since these anomalies did not reappear when checked on ground.

1.4 Although there are some Electro Magnetic Interference (EMI)-related standards for common PEDs, for example, Federal Communications Commission (FCC) and International Special Committee on Radio Interference standards, these are not sufficient to meet the EMI requirements of applicable airworthiness standards. What is of more concern is that many PEDs are currently on sale without certificate for the EMI standards.

1.5 Most civil aviation authorities restrict the use of the PEDs on board by regulation, aiming at improving and ensuring flight safety; however, the level and scope of policies vary amongst States because of the absence of international standards for the use of PEDs on board.

2. DISCUSSION

2.1 Previous statistics on the PED EMI incidents

2.1.1 The most widely referenced source about the PED EMI incidents is “Personal Electronic Devices and their Interference with Aircraft Systems” which analyzed the data of NASA aviation safety reporting system (ASRS) relating to the PED EMI reports from 1986 to 1999. There are 86 incidents suspected to be caused by the PEDs. Some examples of anomaly event are as follows:

- a) VOR, DME, RNAV showed on course, but ATC radar showed 12 miles off course;
- b) LOC erratic with full left deflection; and
- c) radio altimeter indicated 900 ft when aircraft was at 13,000 ft; GPWS sounded “too low”.

2.1.2 Another source of statistics about the PED EMI events occurred during the actual operation is the data of the PED interference reporting system of Japan, operated by the Electronic Navigation Research Institute (ENRI). The total number of incident reports submitted from 1993 to 2006 is 204, and the number of reports appears to be increasing.

2.2 PED interference test of the Republic of Korea

2.2.1 In 2006, Korea Aerospace University and a special committee for aircraft Electro Magnetic Interference (EMI) performed a PED interference test using a Boeing 737 aircraft of the Korean Air to investigate PED interference effects on aircraft systems. Simulated signals of cellular (835 MHz) and PCS (1,765 MHz) phones were generated in the aircraft and navigation/communication systems such as VOR, LOC, GS, VHF Communications, GPS, DME, ATC and ACAS.

2.2.2 The test results showed no observable anomaly in aircraft systems, but it identified the need for additional tests and studies to obtain repeatable and reliable data.

2.3 Comparison of the PED-related rules of the States

2.3.1 ICAO: ICAO has no Standards for portable electronics. Only in Doc. 9376 — *Preparation of an Operations Manual* does ICAO specify that guidance should be given in that manual regarding the use of electronic devices in the passenger cabin and on the need for the manual to include instructions in the passenger briefing. ICAO recommends in the same document that the use of radios, radio-controlled toys, portable telephones and portable television sets should be forbidden as these may interfere with the aircraft navigation systems, but there is no detailed guidance on how to determine to allow a certain type of PED on board.

2.3.2 U.S.: The United States regulates the use of the PEDs on board through the CFR 14 Part 91.21. It states that portable voice recorders, hearing aids, heart pacemakers and electric shavers can be used in any condition, but no one is allowed to operate other PEDs on board unless it has been proven not to cause interference with COM/NAV systems. The operator or pilot-in-command (PIC) of the aircraft is responsible for ensuring that the PEDs to be used in the passenger cabin are safe for operation of aircraft. This may require an EMI test on the PEDs and/or the establishment of procedures to control their use during flight operations. Cellular phones may be used when aircraft are parked on the ground. Types of the PEDs which can be used in the cabin are not specified, and airlines may implement different policies. There are many States applying regulations similar to the CFR 14 Part 91.21.

2.3.3 Japan: "Act of Nuisance Prevention in Aircraft" includes a provision limiting the PEDs use in aircraft and provides a list of the PEDs limited to be used on board. There are 13 types of the PEDs, including cellular phones, personal handy-phone systems (PHSs), notebook computers (if there is wireless local area network (WLAN) system in the aircraft), wireless headphone/earphone, the use of which is always prohibited. In addition, there are 21 types of the PEDs, such as TVs, pagers, GPS receivers, digital cameras, electric chargers, which are permitted during limited phases of flight. Specifying a list of the PED types detailing whether they can be used on board or not enables all operators to have consistent application. Nevertheless, with the proliferation of the PEDs, amendments to the policy should be made through significant efforts.

2.3.4 Europe: Guidelines for the use of the PEDs in aircraft are provided in the JAR OPS 1.110 and TGL 29. Similar to the CFR 14 Part 91.21 of the United States, these prescribe the PEDs which are likely to adversely affect aircraft systems and which should be prohibited by operators. Further, there are limitations not only for passengers, but also for flight and cabin crew, and such provisions are not included in the guideline of the United States and Japan. In addition, there is a recommendation to install equipment which can detect the use of cell phones in aircraft.

2.3.5 Republic of Korea: The ROK regulates the use of the PEDs on board through the Aviation Act and its enforcement regulations, which are similar to the U.S. CFR 14 Part 91.21. These rules prohibit the use of the PEDs, except electric shavers or in any case where operators or PICs decide that certain PEDs do not interfere with aircraft systems based on the aircraft manufacturer's recommendations.

3. CONCLUSION

3.1 Although the increasing use of the PEDs in aircraft can create a new threat to aviation safety, ICAO has no detailed guidance relating to the use of the PEDs yet. Without ICAO Standards or guidance, regulations for the use of the PED on board deem not to be harmonized amongst States as shown by the preceding discussions. Although there is no observable anomaly in the PED EMI test on ground, it is necessary to harmonize the regulations for the use of the PEDs to minimize confusion of passengers.

3.2 ICAO should recognize that the regulations for the use of the PEDs on board are different amongst States, and therefore, should conduct required researches to support developing policies for the use of PEDS in aircraft.

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