



# Portable electronic devices

## Summary

*International regulatory developments and technological changes have prompted a review of New Zealand civil aviation regulations relating to portable electronic devices in New Zealand.*

This paper examines the current New Zealand system in comparison to international regulations and considers whether there is a need to change the current rules regarding the regulation of portable electronic devices.

The paper proceeds to provide a summary of CAA position on both transmitting and non-transmitting devices and concludes that:

- the current rule adequately regulates portable electronic devices
- there is a need to revise advisory circular to update its guidance on testing and operating procedures relating to portable electronic devices
- there is a need to review baggage stowage requirements for critical phases of flight
- there is a need to initiate further communication to provide clarity on portable electronic devices on aircraft to airline operators

## Introduction

*Portable electronic devices are becoming a significant part of people's lives and there is increased demand for people to be in constant contact with their portable electronic devices for entertainment or communication.*

There are two main types of portable electronic devices:

- **non-intentional transmitting portable electronic devices:** portable electronic devices that do not intentionally transmit, but can give off a low level transmission when turned on. Examples include cameras, e-readers, and i-pods. For simplicity these devices are called non-transmitting portable electronic devices.
- **transmitting portable electronic devices** intentionally transmit data, and include any cellular communication, Bluetooth and wireless internet (Wi-Fi).

Both types of portable electronic devices pose a safety hazard to aircraft flying under instrument flight rules as interference from portable electronic devices can interfere with the aircraft's avionic systems<sup>1</sup>.

There have been a number of reported incidents where interference from portable electronic devices affected the aircraft's instrumentation. The Radio Technical Committee for Aeronautics released a report in 1988 that made extensive recommendations for alleviating problems with interference from portable electronic device. The 1988 Radio Technical Commission for Aeronautics recommendations provided the basis for the current requirements in civil aviation rule part 91.7.

The degree of risk associated with the use of portable electronic devices on instrument flight rule aircraft depends on a case by case assessment of the interference between the portable electronic devices transmissions and the avionic instruments on that particular aircraft.

Recent technological changes relevant to portable electronic devices have triggered an assessment of the adequacy of New Zealand's current regulations relating to the inflight use of portable electronic devices on aircraft. Some modern aircraft now have avionic shielding that provides additional protection from interference from portable electronic device transmissions; and enables operators to install pico-cells<sup>2</sup> and Wi-Fi systems into an aircraft.

Recently the Radio Technical Commission for Aeronautics conducted further research that resulted in the development of a standard for determining whether an aircraft can tolerate the interference from portable electronic devices on aircraft.

Following the Radio Technical Committee for Aeronautics recommendations, the Federal Aviation Authority (FAA) and European Aviation Safety Agency (EASA) provided additional guidance to operators on how to expand the use of portable electronic devices on airlines.

### Current System

The current civil aviation rule regulating the use of portable electronic devices during instrument flight rules is outlined below:

#### 91.7 portable electronic devices

- (a) *No person may operate, nor may any operator or pilot-in-command of an aircraft allow the operation of, any cellphone or other portable electronic device that is designed to transmit electromagnetic energy, on any aircraft while that aircraft is operating under instrument flight rules.*
- (b) *Except as provided in paragraph (c), no person may operate, nor may any operator or pilot-in-command of an aircraft allow the operation of, any portable electronic device on any aircraft flying under instrument flight rules during an instrument approach or departure procedure or during any other critical phase of flight.*
- (c) Paragraph (b) does not apply to —
  - (1) *hearing aids;*
  - (2) *heart pacemakers;*
  - (3) *portable voice recorders;*
  - (4) *electric shavers;*
  - (5) *electronic watches; or*
  - (6) *any other portable electronic device if the operator of the aircraft has determined that the portable electronic device to be operated will not cause interference with any aircraft system or equipment in the aircraft on which it is operated.*

<sup>1</sup> Avionic systems are the electronic equipment used on aircraft such as navigation, communication and collision avoidance systems.

<sup>2</sup> A cellular communication station (similar to a small cellphone tower).

(d) In the case of—

*(1) an aircraft being operated on air transport operations, the determination required by paragraph (c)(6) must be made by the operator of the aircraft on which the particular device is to be used; and*

*(2) any other aircraft, the determination required by paragraph (c)(6) may be made by the pilot-in-command or the operator of the aircraft on which the particular device is to be used.*

In practical terms, civil aviation rule 91.7 (a) prohibits the use of transmitting portable electronic devices, so if an airline wants to allow these devices, they must apply to CAA for an exemption to the rule.

Two general rule exemptions have been granted to enable the following transmitting devices to be used on aircraft. These are:

- transmitting portable electronic devices where the transmitting device has been deactivated (i.e. in flight mode) during non-critical phases of flight.
- transmitting implanted medical devices in all phases of flight provided they meet international standards.

There have also been a number of specific exemptions that have been granted for the use transmitting portable electronic devices on particular aircraft. These include Bluetooth usage by aircrew, in-flight entertainment transmitted to passenger's portable electronic devices and the use of cell phones on an aircraft where Pico-cells were fitted.

A New Zealand airline experimented with a Pico-cell in 2011. However this Pico-cell was eventually disabled when the airline could not justify its continued use.

Non transmitting portable electronic devices are treated differently. Civil aviation rule 91.7 (b) enables airlines to determine whether non-transmitting portable electronic devices will cause interference with any aircraft system or equipment and if not, they may allow use of those devices.

In either case, the airline operator needs to amend the processes, such as passenger briefings and stowage procedures in their operating certificate. Advisory circular 119.1 provides further guidance on how to develop detailed procedures and examples of the types of procedures that need to be included.

The application and practicality of civil aviation rule 91.7 (c) (6) was considered as part of this review. The wording in this part of the rule is similar to the wording that is used by the Federal Aviation Administration (FAA), which allows airlines to categorise different types of portable electronic devices to enable efficient testing.

### Process for applying for use of portable electronic devices

There are two different processes that could be used when an operator would like to expand the use of portable electronic devices.

- The exemption process involves additional administration by the CAA, and this is the process that currently occurs with transmitting portable electronic devices.
- The alternative process is a determination which is delegated to the operator to carry out and currently occurs for use of non-transmitting portable electronic devices during critical phases of flight.

Both processes require an amendment to the operator's procedures under Part 119.

Under the regulatory framework, given that some transmitting portable electronic devices have been approved through an exemption, both the rule and general exemptions need to be checked when determining whether a transmitting portable electronic device has already been approved by the CAA.

The CAA is also aware that given technological and international changes, there may be more requests from the airlines and possibly some business jets for exemptions to the transmitting portable electronic device rule. This is unlikely to be a significant administrative burden on the CAA given that there are likely to only be a few operators who may be able to meet the testing requirements.

### International Comparison

In the United States and Europe many major airlines have recently changed their portable electronic device policies following political pressure and demand from passengers. This has been misinterpreted by New Zealand media as amendments to the rules and advisory circulars by the relevant regulatory authorities. For example New Zealand media articles have stated that the "FAA had removed its ban on the use of portable electronic devices in flight". This is not correct. The FAA has not made any changes to its rules or advisory circular; it only provided a guidance document to airline operators. The aviation rulemaking committee in the United States has recommended to the FAA that it also update its Advisory Circular for portable electronic devices.

The civil aviation rule is very similar to the FAA Rule 91.21 in the United States. A comparison between New Zealand and the United States rules is provided in Attachment 1.

In both the United States and New Zealand, operators must seek an amendment to their operator's certificate as procedural changes are required (such as passenger briefings). The regulator can determine whether the procedures manage the safety risk when approving any amendment under the operator certificate.

The guidance that the FAA provided operators outlines the steps required to determine whether their aircraft can safely handle additional portable electronic device usage, and what documentation and procedures need to be developed to ensure safe and effective implementation of those procedures.

Use of mobile phones on aircraft is currently banned under the rules set by the Federal Communication Commission (FCC). Cellular communications connect to the closest ground station. When cell phones are used on aircraft this can result in connections with several cellular stations as there may be several cellular stations that are a similar distance from the aircraft.

The FCC rule is currently being reviewed and it is expected that the FCC will remove the restrictions on the use of cellphones given the invention of pico-cells. If this was to occur, cellphones will only be allowed on aircraft that have pico-cells installed. However, the Department of Transportation is considering restricting in-flight voice communication on cellular and internet calls, not for safety reasons but due to concerns that noisy passengers will talk loudly on their devices.

European Aviation Safety Agency (EASA) allows Transmitting portable electronic devices, if the aircraft is fitted with the necessary equipment and determined to be safe by the operator. Most operators that can allow transmitting portable electronic devices will only allow them during non-critical phases of flight.

### Level of control

Recent changes by the FAA in the United States and EASA have been misinterpreted by some as amending the rules to provide greater leniency than New Zealand. This has been evidenced by the CAA receiving media enquiries on when the CAA will be amending its rules regarding portable electronic device usage.

This is not the case: FAA and EASA's regulatory control are set at an equivalent level to the New Zealand civil aviation rules.

The FAA and EASA have not changed their rules or their advisory circular. These regulatory agencies have only provided greater clarity and guidance on how to go about determining whether the use of portable electronic devices is safe for each operation. This guidance suggests that the following conditions be placed on use of portable electronic devices on aircraft:

- an airline operator must determine that the type of aircraft that they operate can tolerate the transmissions from portable electronic devices, before expanding the use of portable electronic devices to these aircraft types.
- items larger than a laptop must be stowed away during take-off and landing
- passengers must put down devices to listen to the safety briefing
- some equipment during low visibility may not be safely compatible with portable electronic devices and portable electronic devices may need to be turned off during these periods
- Passengers must follow any instructions from the airline crew.

Other countries such as Japan and Canada are also beginning to allow gate to gate usage of portable electronic devices in a similar way to EASA and FAA.

### New Zealand Context

During research into this issue, we could find no significant problems with the current New Zealand rule requirements relating to the use of portable electronic devices on aircraft operating under instrument flight rules.

There are a limited number of airline operators in New Zealand that may consider expanding the use of portable electronic devices on their aircraft.

Some high-end charter operators may also be able to carry out the necessary testing. Foreign airlines carriers that operate in New Zealand follow international regulations and do not need to apply for exemptions in New Zealand.

Smaller airline operators that use instrument flight rules are less likely to be able to pass the testing requirements due to the age of their aircraft. These aircraft operators will need to continue to prohibit portable electronic device usage during critical phases of flight, and transmitting portable electronic device use during all phases of flight.

If demand increases from airlines for transmitting functions to be used on aircraft, the current process enables these airlines to go through the exemption process. The CAA is aware that a high proportion of portable electronic devices now have at least one transmitting function and the need to distinguish between transmitting portable electronic devices and portable electronic devices is becoming less relevant. The CAA will be able to assess the proposal on a case by case basis.

### Guidance on portable electronic devices

Guidance specific to portable electronic devices is provided in advisory circular 91.5. This guidance was last reviewed in 1997 and provides a recommended procedure for use of portable electronic devices on aircraft. It also provides guidance on how to determine whether the aircraft can tolerate transmissions for portable electronic devices.

Key issues not adequately addressed in our existing guidance include:

- current testing procedures
- operating procedures including passenger briefing and stowage procedures

Recommendation: Revise advisory circular to update guidance on testing and operating procedures relating to portable electronic devices

### Testing Procedures

The current Advisory Circular 91.5 provides testing procedures; however these need to be updated as they do not consider recent research and guidance on how to expand the use of portable electronic devices on aircraft.

The Radio Technical Commission for Aeronautics has put out a technical standard known as DO 307, covering portable electronic device tolerance testing procedures. These procedures are supported by the FAA as a suitable means of determining whether it is safe to expand the use of portable electronic devices. The CAA guidance will outline a similar process to the FAA.

The level of testing required depends on what portable electronic devices the airlines want to allow when they expand their portable electronic device policy on the particular aircraft.

### Passenger briefing procedures

Effective management of passenger expectations regarding portable electronic devices needs to be carefully considered minimize non-compliant or unruly behaviour on flights.

Passengers will need to clearly understand and abide by the different policies for portable electronic device use on different aircraft, and the differences between New Zealand and overseas rules.

One of the concerns with allowing portable electronic device usage during all phases of flight is how the airline will manage

any passengers using their portable electronic devices instead of listening to the passenger briefings. Under Rule 91.211, the airline operator must brief every passenger on its portable electronic policy. The airline operator requires approval from the CAA for the operating procedures it uses to meet these responsibilities.

Given the work involved in carrying out the necessary portable electronic devices tolerance testing, larger operators may choose to stage the implementation across their various aircraft types. This will require careful attention from the operator when considering passenger briefings for different aircraft types.

### Stowage procedures

Advisory Circular 119.1 provides stowage of baggage and cargo as an example of an operating procedure that needs to be provided as part of the airline's exposition. The United States and Europe require that larger portable electronic devices such as laptops are stowed away during take-off, whereas smaller items such as i-pods can be held and used during these critical phases of flight.

Civil aviation rule 91.213 prescribes the requirements for stowing baggage in New Zealand during take-off and landing. All baggage must be stowed in a baggage locker or under the passenger seat during take-off and landing. However, this rule is overly prescriptive when the definition in Part 1 for baggage is considered. Baggage is defined as:

*Baggage means personal property of passengers or crew carried on an aircraft by agreement with the operator, or personal property of passengers or crew that is intended by passengers or crew to be carried on an aircraft.*

This definition means that books and portable electronic devices need to be stowed away during take-off and landing. This is not consistent with current practice, as airlines do not require that passengers stow books or personal magazines during critical phases of flight. Guidance on portable electronic devices is likely to follow current practice rather than the strict interpretation of the civil aviation rule requirement. This rule will therefore need to be reviewed in the future.

Recommendation: Review baggage stowage requirements for critical phases of flight

### Public understanding of the use of portable electronic device on aircraft

Anecdotal evidence suggests that general public do not currently understand that there are differences between aircraft and that testing is required before the use of portable electronic devices can be expanded on aircraft. These anecdotes suggest that assumptions have been made by the general public that since airlines are making changes overseas that it is safe to allow portable electronic devices on all New Zealand aircraft. This is not the case.

If an airline makes changes to its portable electronic device policy, it will need to develop a training program for its cabin and flight crew to clearly communicate what

portable electronic devices can be used on the particular aircraft.

Recommendation: Education for operators on their obligations to advise passengers of specific safety issues relating to portable electronic devices on their aircraft

### Conclusion

The current level of control regarding the usage of portable electronic device in New Zealand is similar to the United States and Europe. The New Zealand regulatory framework enables airlines to apply to expand the use of portable electronic devices on their aircraft if they can provide evidence that their aircraft meets international tolerance standards for the different types of devices on their different aircraft. The airline also needs to have adequate operating procedures that manage the safety risk regarding portable electronic device usage.

There are currently a number of misconceptions regarding the usage of portable electronic device both by airlines and the general public which, if not addressed, could pose a hazard. Appropriate crew training, passenger briefings, safe stowage guidelines are also required to manage the safety risk with portable electronic device usage.

In order to address the issues the CAA has concluded that:

- the current rule adequately regulates portable electronic devices.
- there is a need to revise advisory circular to update its guidance on testing and operating procedures relating to portable electronic devices.
- there is a need to review baggage stowage requirements for critical phases of flight
- there is a need to initiate further communication to provide clarity on portable electronic devices on aircraft to airline operators.

### Attachment 1: Difference between FAA and CAA Rules for PEDs

NZCAA	FAA	Differences
<p>(a) No person may operate, nor may any operator or pilot-in-command of an aircraft allow the operation of, any cellphone or other portable electronic device that is designed to transmit electromagnetic energy, on any aircraft while that aircraft is operating under Instrument flight rules.</p>	<p>None.</p> <p>Although the FAA has strict guidance material relating to transmitting portable electronic devices.</p>	<p>The FAA does not have a rule that specifically mentions prohibiting transmitting portable electronic devices. However it has strict guidance material for determining an acceptable means of compliance.</p> <p>The CAA allows airlines to apply for an exemption if they would like to allow transmitting portable electronic devices.</p>
<p>(b) Except as provided in paragraph (c), no person may operate, nor may any operator or pilot-in-command of an aircraft allow the operation of, any portable electronic device on any aircraft flying under Instrument flight rules during an instrument approach or departure procedure or during any other critical phase of flight.</p>	<p>a) Except as provided in paragraph (b) of this section, no person may operate, nor may any operator or pilot in command of an aircraft allow the operation of, any portable electronic device on any of the following U.S.-registered civil aircraft:</p> <p>(1) Aircraft operated by a holder of an air carrier operating certificate or an operating certificate; or</p> <p>(2) Any other aircraft while it is operated under Instrument flight rules</p>	<p>NZ allows the use of portable electronic devices during the cruise phase of flight, but restricts the use during other phases.</p> <p>US ban portable electronic devices use during all phases of flight unless it has been determined to be safe.</p>
<p>(c) Paragraph (b) does not apply to</p> <p>(1) hearing aids;</p> <p>(2) heart pacemakers;</p> <p>(3) portable voice recorders;</p> <p>(4) electric shavers;</p> <p>(5) electronic watches; or</p> <p>(6) any other portable electronic device if the operator of the aircraft has determined that the portable electronic device to be operated will not cause interference with any aircraft system or equipment in the aircraft on which it is operated.</p>	<p>Paragraph (a) of this section does not apply to—</p> <p>(1) Portable voice recorders;</p> <p>(2) Hearing aids;</p> <p>(3) Heart pacemakers;</p> <p>(4) Electric shavers; or</p> <p>(5) Any other portable electronic device that the operator of the aircraft has determined will not cause interference with the navigation or communication system of the aircraft on which it is to be used.</p>	<p>Electronic watches have been added to the NZ regulations and both allow for airlines to determine that aircraft can safely allow Portable electronic devices.</p> <p>Because the FAA does not have a ban on transmitting devices, the determination process is also used for transmitting portable electronic devices.</p>
<p>(d) In the case of—</p> <p>(1) an aircraft being operated on air transport operations, the determination required by paragraph (c)(6) must be made by the operator of the aircraft on which the particular device is to be used; and</p> <p>(2) any other aircraft, the determination required by paragraph (c)(6) may be made by the pilot-in-command or the operator of the aircraft on which the particular device is to be used.</p>	<p>(c) In the case of an aircraft operated by a holder of an air carrier operating certificate or an operating certificate, the determination required by paragraph (b) (5) of this section shall be made by that operator of the aircraft on which the particular device is to be used. In the case of other aircraft, the determination may be made by the pilot in command or other operator of the aircraft</p>	<p>Same intention.</p>