

FIJI AERONAUTICAL INFORMATION CIRCULAR



Civil Aviation Authority of Fiji
Private Mail Bag (NAP0354), Nadi Airport
Fiji
Tel: (679) 6721 555; Fax (679) 6721 500
Website: www.caafi.org.fj

AIC 07/09
Effective
17 December
2009
OPS

This AIC cancels AIC 05/07

TRANSPONDERS, ENHANCED GROUND PROXIMITY WARNING SYSTEMS (EGPWS), AIRSPACE REQUIREMENTS, EMERGENCY LOCATION TRANSMITTERS (ELTS) AND THE IMPLEMENTATION OF AIRCRAFT SURVEILLANCE

1. Purpose

The purpose of this AIC is to update industry regarding several changes in the requirements for aircraft equipment and the associated changes to the requirements for operations in certain parts of the airspace administered by Fiji.

2. Background

There have been some changes to the advice issued in late 2007 in AIC 05/07 as a result of reviews of how and when the changes should be implemented.

Amendments to the Air Navigation Regulations expected to become effective early in 2010 will require that certain aircraft will need to be fitted with transponders, other aircraft will require the fitment of Enhanced Ground Proximity Warning Systems (EGPWS) or an acceptable alternative and others will require fitment of equipment associated with aircraft surveillance.

Further, in order to achieve and maintain an acceptable level of safety, operations in certain airspaces administered by Fiji will require that, with approved exceptions, aircraft will have to have specific equipment serviceable and operating to fly in those airspaces.

The specifications of these requirements are given in more detail under subsequent sub-headings. The actual legal requirements will be empowered by amendments to the Air Navigation Regulations and the Fiji Aeronautical Information Publication with sufficient notice to enable operator and aircraft compliance.

3. Transponders

Whilst around 50% of Fiji registered aircraft are fitted with transponders, they have not been mandated to date as they are primarily used in conjunction with secondary radar, which is not used in Fiji, as a means of providing the relevant air traffic service operator with information as to the aircraft's location and identity.

When operated in the 'Mode C' category in association with an encoding altimeter or blind encoder they also provide information as to the aircraft's altitude or flight level.

This information can then be used by the air traffic management services to ensure that adequate aircraft separation is maintained whilst providing an operationally beneficial flow of traffic.

But transponders also have a very important secondary function – the transponder enables any aircraft with an Airborne Collision Avoidance System (ACAS and also known as Traffic Alert and Collision Avoidance System or TCAS) to 'see' any aircraft with an operating transponder. This safety enhancement has on many occasions been the last line of defence in collision avoidance.

ICAO Standards have required the fitment of ACAS/TCAS to aircraft since the 1990s and Fiji has complied with this Standard for aircraft operating internationally as have all foreign registered aircraft operating into Fiji administered airspace. But those aircraft were unable to 'see' the majority of domestic aircraft as most of the domestic aircraft were not transponder equipped. An amendment to ICAO's Annex 6 in 1998 introduced a Standard that requires all aircraft to be transponder equipped so as to be 'visible' to ACAS/TCAS equipped aircraft, thus enhancing safety.

But there are different types of transponders and there existed at that time the probability that, for other reasons, the more technologically advanced type would soon be required in Fiji. The decision to mandate fitment was therefore deferred until the type of transponder required had been decided upon.

The Fiji requirement for the fitment of a transponder to, with certain exceptions, all aircraft is included in the batch of ANR amendments due to come into effect early in 2010.

All aircraft operators should therefore consult with their avionics engineer as to what type of transponder should be installed and arrange to have it fitted by the due date, likely to be 1st Quarter 2010.

4. Enhanced Ground Proximity Warning Systems (EGPWS)

This type of safety enhancement is also becoming known as Terrain Awareness Warning System (TAWS) and the terms are becoming interchangeable.

ICAO has established a Standard that requires that all aircraft authorised to carry 10 or more passengers shall be fitted with an Enhanced Ground Proximity Warning Systems (EGPWS). There is no differentiation between aircraft used in scheduled or charter operations, between piston or turbine powered aircraft or whether they operate under Instrument or Visual Flight Rules.

In accordance with government policy, this requirement is being implemented in the batch of ANR amendments due to come into effect early in 2010.

The Authority has reviewed this requirement and considered options that will provide an equivalent level of safety. The specifications for EGPWS are quite extensive, particularly for smaller aircraft. The Authority is aware that certain surveillance systems can and do provide warnings when an aircraft departs from a safe trajectory and becomes at risk of collision with terrain.

Taking into consideration these factors, the Authority is prepared to accept the simpler TAWS B system for aircraft below 5700 kg MCTOW when the aircraft is operating in a surveillance environment such that departure from a safe trajectory would be readily detected and corrective action initiated. Software to provide TAWS B capability is available, at moderate and reasonable cost, as an upgrade on the more advanced combined GPS receiver and navigation and communications system from one well known original equipment manufacturer. This equipment will also meet other requirements for system upgrades likely to be introduced in 2010.

Again, aircraft operators should therefore consult with their avionics engineer as to what type of equipment should be installed and arrange to have it fitted by the due date, likely to be 1st Quarter 2010.

5. Surveillance

The Authority has for quite some time indicated that there is a need for Fiji to implement aircraft surveillance. There are a number of reasons justifying the requirement.

- a) The ICAO audit of 2006 resulted in a finding that Fiji should introduce a surveillance system to meet ICAO requirements of monitoring RNP and RVSM operations in the Fiji Flight Information Region;
- b) The ICAO audit also found that surveillance was highly desirable at the Nadi and Nausori international aerodromes;
- c) ICAO had taken the decision, supported by the International Air Transport Association, that the air traffic management system of the future would be the satellite based Automatic Dependent Surveillance – Broadcast system and, for the Asia Pacific Region, should be implemented forthwith;
- d) The Authority had found an increasing number of losses of separation, both in and outside controlled airspace that were reducing the level of safety to one that was unacceptable and that corrective action was required;
- e) The Authority was concerned by the number of reports that pilots were deliberately falsifying position and/or altitude reports primarily with the objective of gaining an operational advantage; and
- f) Air traffic management and the Authority were concerned that air traffic management staff were increasingly showing signs of difficulty in maintaining an adequate level of situational awareness.

Additionally, surveillance was compatible with and complimentary to other

technological improvements being introduced to the industry with commensurate improvements in the level of safety, important in Fiji's case for an economy that relies significantly on tourism whose main means of travel is by aircraft to, from and within Fiji.

The Surveillance Implementation Project (SIP) team established in the second half of 2006 thoroughly reviewed both the need for surveillance and the operational, efficiency and ongoing economics of surveillance systems available and presented its findings to the management of the air traffic service provider and the Authority late in 2006. That team report and other decision making events lead to the signing of a contract early in 2009 for the upgrade of the existing air traffic management system to one that would meet current requirements and those likely in the next 15 to 20 years and the implementation of a surveillance system that would significantly improve the level of safety in domestic operations.

The likely timeframe for air traffic management system replacement and surveillance implementation is –

- Further briefings to stakeholders regarding the risk assessment and decision justification – Q4 2009;
- Commencement of ground system installation – Q4 2009;
- Commencement of aircraft equipment installations – Q4 2009;
- Initial trials of system operability – Q4 2009;
- Completion of aircraft equipment installations – Q1 or early Q2 2010;
- System commissioning and Fiji domestic airspace becomes Transponder Mandatory – Q1 2010;
- *Airspace redesign completed and implemented – Q1 2012; and
- *Designation of ADS-B Mandatory airspace – Q4 2013.

Note Further details on last two bullet points marked * are in following section on airspace.

Implementation of surveillance will not only improve the safety level in domestic airspace, it will also bring advantages to upper airspace users. It will facilitate the introduction of UPRs (User Preferred Routes), DARPs (Dynamic Air Route Planning) and enable aircraft to operate more frequently to their optimal trajectory bringing operational, economic and environmental improvements such as those shown possible in the ASPIRE programme and the goal for everyday operations.

6. Airspace

Part of the overall project for air traffic management upgrade and surveillance implementation includes a review of Fiji's existing airspace and, as appropriate, a redesign so as to be able to gain the most in operational and economic improvements with the facilities and capabilities offered by the new systems.

A meeting has already been held with stakeholders to identify existing deficiencies and look for improvements. There will be further consultation with stakeholders before any redesign is finalized. The redesigned airspace will likely be introduced between 2011 and 2012, depending on a number of circumstances.

In order to ensure that all aircraft, with some specific exceptions, are visible to the air traffic management system, it is expected that the Fiji domestic airspace, whether controlled or uncontrolled, will be declared as 'Transponder Mandatory' from early 2010. Provision will be made for an aircraft with an unserviceable transponder to proceed to a place where the equipment can be repaired or replaced. Non-transponder ferry flights may be permitted under strictly controlled conditions.

For the longer term, it is likely that most, if not all, of the Fiji Flight Information Region (FIR) will become ADS-B Mandatory coincident with the same situation in neighbouring FIRs. In this regard it should be noted that Australia has declared its airspace at and above FL 290 as ADS-B Mandatory as of 12th December 2013. The date for Fiji's airspace is likely to be the same.

7. Emergency Location Transmitters (ELTs)

In view of the introduction of other technological improvements, the Authority has determined that, for domestic operations, there is very little advantage to be gained by the carriage of an ELT. Surveillance will readily provide an accurate indication of an aircraft's trajectory before it disappeared from the surveillance screen and its likely position determined with a high degree of accuracy, facilitating search and rescue operations. Domestic operators may, of course, elect to carry any such facilities as meets their requirements provided airworthiness requirements are observed.

International operations, however, will still be required to meet ICAO Standards in all aspects.