

GUERNSEY ADVISORY CIRCULAR (GACs)



GAC OPS-6



Aircraft Tracking

© Published by the Director of Civil Aviation, Guernsey

First Issue

March 2019

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1 - Purpose

This GAC provides guidance and information to all commercial operators on AT when conducting international operations.

2 - Related laws, regulations and requirements

This GAC relates to:

1. GAR 119.63

No rights can be derived from this document. For exact details please refer to The Air Navigation (Bailiwick of Guernsey) Law, 2012 (Law). In case of conflict between this guidance document and the Law, 2012, the latter shall prevail.

3 - Definitions

Definitions, in the context of this GAC shall have the meanings listed in GAR Part 1 (Definitions, Abbreviations and Units of Measurement).

4 - Background

After the Malaysian flight MH370 aircraft disappeared on March 8, 2014, the International Civil Aviation Organization (ICAO) initiated a committee to review and make recommendations for improving AT and GADSS. The committee incorporated their findings into ICAO Annex 6 Part I Operation of Aircraft, International Commercial Air Transport-Aeroplanes, Section 3.5 with an effective date of November 8, 2018.

5 – Discussion

Each operator (AOC holder) shall establish an aircraft tracking capability to track aeroplanes throughout its area of operations (GAR 119.63(a)) and each operator shall establish procedures, approved by the Guernsey DCA, for the retention of aircraft tracking data to assist SAR in determining the last known position of the aircraft¹ (GAR 119.63(c)).

Note 1. — when using third parties for the conduct of aircraft tracking the operator shall develop policies and procedures for third parties that perform work on its behalf.

Regarding automated reporting the following requirement is stated in GAR 119.63(b):

The operator shall track the position of an aeroplane through automated reporting at least every 15 minutes for the portion(s) of the in-flight operation(s) that is planned in an oceanic area(s)² under the following conditions³ :

- a) the aeroplane has a maximum certificated take-off mass of over 45 500 kg and a seating capacity greater than 19; and
- b) where an ATS unit obtains aeroplane position information at greater than 15 minute intervals.

Note 2. — Oceanic area, for the purpose of aircraft tracking, is the airspace which overlies waters outside the territory of a State.

Note 3. — See Annex 11, Chapter 2, for coordination between the operator and air traffic services providers regarding position report messages.

Furthermore it is recommended that each operator tracks the position of an aeroplane through automated reporting at least every 15 minutes for the portion(s) of the in-flight operation(s) under the following conditions⁴ :

- a) the aeroplane has a maximum certificated take-off mass of over 27 000 kg and a seating capacity greater than 19; and
- b) where an ATS unit obtains aeroplane position information at greater than 15 minute intervals.

Note 4. — See Annex 11, Chapter 2, for coordination between the operator and air traffic services providers regarding position report messages.

Notwithstanding this requirement and recommendation, the Guernsey DCA may, based on the results of an approved risk assessment process implemented by the operator, allow for variations to automated reporting intervals. The process shall demonstrate how risks to the operation, resulting from such variations, can be managed and shall include at least the following:

- a) capability of the operator's operational control systems and processes, including those for contacting ATS units;
- b) overall capability of the aeroplane and its systems;
- c) available means to determine the position of, and communicate with, the aeroplane;
- d) frequency and duration of gaps in automated reporting;
- e) human factors consequences resulting from changes to flight crew procedures; and
- f) specific mitigation measures and contingency procedures.

Note.— Guidance on development, implementation and approval of the risk assessment process, which allows for variations to the need for automatic reporting and the required interval, including variation examples, is contained in the Aircraft Tracking Implementation Guidelines (ICAO Circular 347).

For additional guidance, reference ICAO Circular 347 Aircraft Tracking Implementation Guidelines.

6 – Aircraft Tracking Solutions

There are many products, services, and procedures available and in use today that provide operators the ability to locate and track their aircraft. High-level we can distinguish aircraft tracking via Surveillance Services and tracking by Operators. Commonly used solutions are described in the following paragraphs but other solutions may be available as well.

6.1 Aircraft Tracking via Surveillance Services

Large and commercially operated aircraft are usually under air traffic control/ air traffic services (ATC/ATS) throughout all phases of their flight(s). ATC/ ATS includes essential communication, navigation, and surveillance services; surveillance is used to manage aircraft separation requirements. Because surveillance services provide the location and identification of an aircraft in order to manage separation it also can serve as a form of aircraft tracking. In fact, a large number of aircraft operators currently use ATS surveillance services for the purpose of tracking their aircraft, particularly in medium to high density airspace. Surveillance services can be disrupted, however, due to planned or unplanned maintenance issues or equipment availability. For ground based radars that provide surveillance services, there can be permanent or periodic line of sight limitations due to obstructions and the curvature of the earth. These disruptions need to be taken into account when considering aircraft tracking options. In low density airspace—commonly referred to as oceanic or remote airspace—aircraft location and identification is approached differently. This information is often provided by periodic position reports and voice communications between the flight crew and the ANSP. In some low density airspace, Automatic Dependent Surveillance – Contract (ADS C) is used to obtain position reports; however, this use of ADS-C is limited either because the ANSP does not support ADS-C or the aircraft is not equipped.

6.2 Aircraft Tracking by Operators

6.2.1 ACARS

ACARS position reports can also fulfil the near term aircraft tracking criteria

independent of ADS-C. ACARS uses FMS derived position information and is used today by many operators to track their flights. The use of ACARS is still dependent upon the use of the existing communication service provider networks and there are associated costs. Unlike ADS-C, ACARS does not provide conformance monitoring, although it is possible for an operations control centre to monitor flight path conformance using customized software.

Furthermore it is possible to add tracking capabilities to the ACARS maintenance reporting system with software modifications to their on board equipment. This modification provides position reports every 10 minutes, with increased reporting frequency triggered by unanticipated altitude changes or flight levels below a predetermined altitude. In addition, flight track deviations may be flagged to an operations control centre through dedicated software.

6.2.2 GNSS

There are products available today that determine the aircraft position using Global Navigation Satellite System (GNSS) and transmit that information using satellite relay which could be a solutions for aircraft operating beyond the range of ATS surveillance systems which are not equipped with ADS-C or, in some cases, ACARS.

6.2.3 SB ADS-B

Space-based (SB) ADS-B uses signals from aircraft Mode-S transponders. The system is based on an active constellation of 66 low earth orbit satellites with geo-synchronous orbits that provide worldwide coverage. The system will also have 9 backup satellites available in orbit as well. Currently the SB ADS-B system is being tested and evaluated e.g. by ICAO and FAA.

For additional guidance, reference the Aircraft Tracking Task Force (ATTF) which was established by the International Air Transport Association (IATA).

7 – Recommend Actions

Directors of Safety and Directors of Operations shall ensure AT procedures are established, any appropriate risk assessments are completed and the retention of this information is coordinated and shared during a search and rescue operation.

END