

## Annex III to ED Decision 2017/023/R

### 'AMC and GM to Part-CAT — Issue 2, Amendment 13

The Annex to Decision 2014/015/R is amended as follows:

The text of the amendment is arranged to show deleted text, new or amended text as shown below:

- (a) deleted text is marked with ~~strikethrough~~;
- (b) new or amended text is highlighted in grey;
- (c) an ellipsis (...) indicates that the remaining text is unchanged in front of or following the reflected amendment.

1. Two new AMC to CAT.GEN.MPA.205 are inserted as follows:

#### **AMC1 CAT.GEN.MPA.205 Aircraft tracking system — Aeroplanes**

##### **EQUIPMENT, PERFORMANCE AND PROCEDURES WHEN AIRCRAFT TRACKING IS REQUIRED**

###### **(a) Automatic tracking of aeroplane position**

The aircraft tracking system should rely on equipment capable of automatically detecting and transmitting a position report to the aircraft operator, except if (d)(2) applies.

###### **(b) Position reporting period**

The tracking of an individual flight should provide a position report at time intervals which do not exceed 15 minutes.

###### **(c) Content of position reports**

Each position report should contain at least the latitude, the longitude and the time of position determination and whenever available, an indication of the aeroplane altitude, except that for each flight:

- (1) One of the position reports may contain only time-stamped data indicating that the aeroplane has left the gate;
- (2) One of the position reports may contain only time-stamped data indicating that the aeroplane has become airborne;
- (3) One of the position reports may contain only time-stamped data indicating that the aeroplane has landed; and
- (4) One of the position reports may contain only time-stamped data indicating that the aeroplane has reached the gate.

###### **(d) Source of position data**

The data contained in a position report may come from:

- (1) ATC surveillance systems, if the ATC surveillance data source is capable of providing this data with a delay equal to or less than 10 minutes;
- (2) the flight crew, if the planned flight duration is less than two position reporting periods ;

(3) aeroplane systems. In that case:

(i) the source of time, latitude and longitude data should be the navigation system of the aeroplane or an approved GNSS receiver;

(ii) the source of altitude data should be:

(A) the same source as for time, latitude and longitude data, or

(B) an approved source of pressure altitude; and

(iii) the delivery time of position reports from the aeroplane to the operational control over the flight should, to the extent possible, not exceed 10 minutes; or

(4) any data source when the position report is of a type designated by (c)(1), (c)(2), (c)(3) or (c)(4). In that case, the delivery time of position reports from the data source to the operational control over the flight should, to the extent possible, not exceed 10 minutes.

(e) Temporary lack of aircraft tracking data

Aircraft tracking data may be incomplete due to a temporary or unexpected issue prior to or during the flight. However, the operator should:

(1) identify any loss of aircraft tracking data which is not due to a temporary issue, and

(2) address any systematic lack of aircraft tracking data affecting a given aeroplane or a given route in a timely manner.

(f) Operational control over the flights

When abnormal flight behaviour is suspected, this should be checked and acted upon without delay.

(g) Recording of aircraft tracking data during normal operation

When the tracking of a flight is required, all related aircraft tracking data should be recorded on the ground, including position data from ATC surveillance systems when they are used. The aircraft tracking data of a given flight should be retained until confirmation that the flight is completed and no accident or serious incident occurred.

(h) Preserving aircraft tracking data after an accident or a serious incident

Following an accident or a serious incident, the operator should retain the aircraft tracking data of the involved flight for at least 30 days. In addition, the operator should be capable of providing a copy of this data without delay and in an electronic format that is human-readable using a common text file editor.

(i) Procedures

The operator should establish procedures describing its aircraft tracking system, including the identification of abnormal flight behaviour and the notification of the competent ATS unit, when appropriate. These procedures should be integrated with the emergency response plan of the operator.

**AMC2 CAT.GEN.MPA.205 Aircraft tracking system — Aeroplanes**

**ROUTES INCLUDED IN AIRSPACE COVERED BY ATS SURVEILLANCE**

- (a) Trajectory points located at a distance of less than 50 NM from the departure airfield and trajectory points located at a distance of less than 50 NM from the destination airfield may be considered as not part of the 'planned route'.
- (b) Trajectory points located at a distance of less than 50 NM from any diversion airfield may be considered as not part of the 'planned diversion routes'.
- (c) An ATS surveillance service may be considered 'supported by ATC surveillance systems locating the aircraft at time intervals with adequate duration' if those ATC surveillance systems are capable of locating aircraft at time intervals not exceeding 15 minutes when operated normally.
- (d) When applicable, the operator should check that the conditions required for using the exception defined by CAT.GEN.MPA.205(b) are fulfilled before operating into new airspace blocks.
- (e) When applicable, the operator should check at time intervals not exceeding 180 calendar days that the conditions required for using the exception defined by CAT.GEN.MPA.205(b) are maintained.

2. Seven new GM to CAT.GEN.MPA.205 are inserted as follows:

**GM1 CAT.GEN.MPA.205 Aircraft tracking system — Aeroplanes**

**EXPLANATION OF TERMS**

For the understanding of the terms used in CAT.GEN.MPA.205:

- (a) 'capability to provide a position additional to the secondary surveillance radar transponder' means airborne equipment other than the SSR transponder, which is operative and which can be used to automatically transmit time-stamped position data without change to the approved airborne systems; and
- (b) 'abnormal flight behaviour': see GM1 to Annex I (Definitions).

**GM2 CAT.GEN.MPA.205 Aircraft tracking system — Aeroplanes**

**DETERMINING WHETHER A FLIGHT NEEDS TO BE TRACKED**

Table 1 provides a summary of the cases applicable to an aeroplane which is within the scope of CAT.GEN.MPA.205(a).

**Table 1: Cases applicable to the flight of an aeroplane subject to the aircraft tracking requirement**

<p><b>Condition 1:</b> The planned route and the planned diversion routes are included in airspace blocks where ATS surveillance service is normally provided.</p>	<p><b>Condition 2:</b> The ATS surveillance service provided in all airspace blocks determined by Condition 1 is supported by ATC surveillance systems locating the aircraft at time intervals with adequate duration.</p>	<p><b>Condition 3:</b> The operator has provided all air navigation service providers competent for the airspace blocks determined by Condition 1 with the necessary contact information.</p>	<p><b>Case considered:</b> Aeroplane that is within the scope of CAT.GEN.MPA.205(a).</p>
<p>Conditions 1, 2 and 3 are met altogether.</p>			<p>The flight does not need to be tracked (refer to CAT.GEN.MPA.205(b)).</p> <p><b>Note:</b> The operator should check at regular time intervals that Conditions 1, 2 and 3 are still met (refer to AMC2 CAT.GEN.MPA.205).</p>
<p>Either Condition 1, Condition 2 or Condition 3 is not met.</p>			<p>The flight shall be tracked (refer to CAT.GEN.MPA.205(b)).</p> <p><b>Note:</b> Lack of aircraft tracking data due to a temporary or unexpected issue may be acceptable (refer to AMC1 CAT.GEN.MPA.205). Examples of issues (list is indicative and not exhaustive): airborne equipment found inoperative, transmission link disturbed by environmental factors; issue with the ground-based infrastructure or the space-based infrastructure.</p>

**GM3 CAT.GEN.MPA.205 Aircraft tracking system — Aeroplanes**

**METHOD FOR ASSESSING WHETHER A FLIGHT NEEDS TO BE TRACKED**

The following gives an example of a method to assess whether flights performed along a given route need to be tracked.

- (a) Determine the planned route and the planned diversion routes and consider only points of these routes located at a distance of greater than or equal to 50 NM from the departure airfield, the

destination airfield and the diversion airfields. If there is no such point, then the flight does not need to be tracked, otherwise go to (b).

(b) Identify all airspace blocks crossed by the result of (a) and go to (c).

(c) If every airspace block meets all of the following conditions, then the flight does not need to be tracked:

- (1) ATS surveillance service is provided in the airspace block;
- (2) This ATS surveillance service relies on ATC surveillance systems which are normally capable of detecting aircraft in the airspace block at time intervals not exceeding 15 minutes; and
- (3) The air navigation service provider competent for the airspace block has information sufficient to contact the on-duty staff at the operator;

**GM4 CAT.GEN.MPA.205 Aircraft tracking system — Aeroplanes**

**POSSIBLE SOURCES AND MINIMUM CONTENT OF A POSITION REPORT**

Table 1 presents a summary of the possible sources and the minimum content of a position report according to AMC1 CAT.GEN.MPA.205.

**Table 1: Possible sources and minimum content of a position report**

Planned flight duration	Possible sources of a position report	Minimum content of a position report
Flight duration < 2×reporting period	<ul style="list-style-type: none"> <li>• Airborne equipment (automatic transmission);</li> <li>• Flight crew; or</li> <li>• ATC surveillance systems.</li> </ul>	Latitude, longitude and time (and whenever available altitude), except for the position reports designated by point (c)(1), (c)(2), (c)(3) and (c)(4) of AMC1 CAT.GEN.MPA.205.
Flight duration ≥ 2×reporting period	<ul style="list-style-type: none"> <li>• Airborne equipment (automatic transmission);</li> <li>• ATC surveillance systems;</li> <li>• Flight crew if the flight is not required to be tracked; or</li> <li>• Any source for position reports designated by point (c)(1), (c)(2), (c)(3) and (c)(4) of AMC1 CAT.GEN.MPA.205.</li> </ul>	

## **GM5 CAT.GEN.MPA.205 Aircraft tracking system — Aeroplanes**

### **AIRCRAFT TRACKING — CHOICE OF THE POSITION REPORTING PERIOD**

(a) Unless the aircraft tracking system includes functionalities enhancing the detection of deviations from normal operation (e.g. airborne systems capable of automatically transmitting more information under some conditions, possibility for the operational control to adjust the position reporting period of an ongoing flight, etc.), the choice of the position reporting period has a significant influence on the effectiveness of the aircraft tracking system.

(1) Indeed, assuming that an operator has set itself the objective of detecting, within a given time T, deviations from normal operation, and that the operator relies for this purpose only on position reports, then the position reporting period needs to be less than T.

(2) Furthermore, when no other information than position reports is available to locate a missing aircraft, then the search zone is a circle with a radius corresponding to the distance likely to have been covered since the last detection. The corresponding search area grows as the square of the time, until the position of the aircraft is detected again or the fuel on board is exhausted. Taking the example of an aeroplane cruising at Mach 0.8 (i.e. covering a distance of about 8 NM per minute), after 15 minutes the search area is 155 000 square kilometres.

(3) In the publication of the Australian Transportation Safety Bureau titled 'The Operational Search for MH370' (dated October 2017), it is recommended that 'Aircraft operators, aircraft manufacturers, and aircraft equipment manufacturers investigate ways to provide high-rate and/or automatically triggered global position tracking in existing and future fleets'.

(b) It is advised to take the above into account when setting up the aircraft tracking system.

## **GM6 CAT.GEN.MPA.205 Aircraft tracking system — Aeroplanes**

### **PROVIDING CONTACT INFORMATION TO COMPETENT AIR NAVIGATION SERVICE PROVIDERS**

One possible way of ensuring that contact information has been made available to all the competent air navigation service providers is to provide in the ATS flight plan (item 18 'Other information') information sufficient to contact the on-duty staff of the aircraft operator.

## **GM7 CAT.GEN.MPA.205 Aircraft tracking system — Aeroplanes**

### **GUIDANCE**

Additional guidance for the establishment of an aircraft tracking system is found in ICAO Circular 347 – Aircraft Tracking Implementation Guidelines, dated 2017.

3. The following new GM to CAT.IDE.A.285 is inserted as follows:

### **GM1 CAT.IDE.A.285(f)(2) Flight over water**

#### **ROBUST AND AUTOMATIC MEANS TO LOCATE THE POINT OF END OF FLIGHT AFTER AN ACCIDENT**

CAT.IDE.A.285(f)(2) refers to means such as required by CAT.GEN.MPA.210 'Location of an aircraft in distress'. The adjective 'robust' in CAT.IDE.A.285 (f)(2) indicates that this means is designed to provide the location of the point of end of flight in non-survivable accident scenarios as well as in survivable accident scenarios.