



**WORKING PAPER**

**ASSEMBLY — 39TH SESSION**

**TECHNICAL COMMISSION**

**Agenda Item 33: Aviation safety and air navigation monitoring and analysis**

**AIRCRAFT TRACKING DURING ABNORMAL OPERATIONS**

(Presented by Singapore)

**EXECUTIVE SUMMARY**

The proposed revised concept of Global Aeronautical Distress and Safety System (GADSS) consists of the following components – Aircraft Tracking (during normal and abnormal operations), Autonomous Distress Tracking and Flight Data Recovery. These components have been addressed in the recent amendments to ICAO Annex 6, Part I, with the exception of aircraft tracking during abnormal operations, which will be addressed through the on-going work of GADSS Advisory Group. According to GADSS Concept of Operations, the implementation of aircraft tracking during abnormal operations is desirable but dependent on the operator’s capability.

This paper discusses the importance of aircraft tracking during abnormal operations, and recommends that ICAO expedite the development of guidance material for aircraft tracking during abnormal operations. This will assist States in defining the performance specifications (e.g. triggering events and conditions) and in enhancing the coordination procedures with air traffic services (ATS) and search and rescue (SAR) units, etc., should they wish to implement aircraft tracking during abnormal operations on their operators.

**Action:** The Assembly is invited to:

- a) note the importance of aircraft tracking during abnormal operations; and
- b) request ICAO to expedite the development of guidance material for aircraft tracking during abnormal operations.

<i>Strategic Objectives:</i>	This working paper relates to the Safety Strategic Objective.
<i>Financial implications:</i>	Expected that this is covered in the draft budget.
<i>References:</i>	Annex 6 – <i>Operation of Aircraft</i> GADSS – Concept of Operations ( <a href="http://www.icao.int/safety/globaltracking/Pages/Homepage.aspx">http://www.icao.int/safety/globaltracking/Pages/Homepage.aspx</a> )

## 1. INTRODUCTION

1.1 In May 2014, ICAO convened a special meeting comprising States, industry and related specialists to develop proposals for the global tracking of flights as a matter of priority. That meeting recommended that a concept of operations be developed that would clarify the objectives of aircraft tracking, namely to ensure that timely information would be available in support of search and rescue, recovery and accident investigation activities.

1.2 The concept of operations, also known as the Global Aeronautical Distress and Safety System (GADSS), was subsequently developed and endorsed by the ICAO High Level Safety Conference in February 2015. The GADSS consists of the following system components related to aircraft tracking and locating:

a) **Aircraft Tracking (during normal and abnormal operations)**

Aircraft tracking during normal operations is intended to facilitate the timely identification and location of the aeroplane. This would require operators to implement operational capability to track their aeroplanes through automated reporting of at least every 15 minutes.

In the event of an on-board abnormal situation, the aircraft tracking system should have the ability to automatically increase its reporting rate based on certain triggering parameters. If the conditions that led to the increased reporting rate cease to exist, the reporting would revert to the original rate (i.e. at intervals of 15 minutes or less).

Amendment 39 to ICAO Annex 6, Part 1, addressing requirements for aircraft tracking during normal operations will become applicable on 8 November 2018.

b) **Autonomous Distress Tracking (ADT)**

The ability to track an aeroplane in distress will greatly facilitate the search and location of wreckage and rescue of survivors in event of a crash, as well as the prompt recovery of flight recorders for accident investigation purposes. A study conducted by the Triggered Transmission Working Group as a result of the Air France 447 investigation determined that if the rate of position information were transmitted once per minute, the crash site could possibly be located to within a 6 NM radius in approximately 95 per cent of the cases.

Amendment 40 to ICAO Annex 6, Part 1, addressing Autonomous Distress Tracking will become applicable only to aeroplanes for which the certificate of airworthiness is first issued on or after 1 January 2021.

1.3 Requirement for aircraft tracking during abnormal operations would be addressed through the on-going work of the GADSS Advisory Group. According to the GADSS Concept of Operations, implementation of aircraft tracking during abnormal operations is desirable but dependent on the air operator's capability.

## 2. **IMPORTANCE OF AIRCRAFT TRACKING DURING ABNORMAL OPERATIONS**

2.1 Aircraft tracking during abnormal operations could provide forewarning of a distress situation, alerting the operator whenever the aeroplane is in an uncertain situation. Once activated, the operator's operations control centre could assist in resolving the abnormal condition before it escalates into a distress situation. If the abnormal condition cannot be resolved, the operator could facilitate timely assistance by coordinating with the relevant Air Traffic Services (ATS) / Search and Rescue (SAR) entities.

2.2 The higher position reporting rate of aircraft tracking during abnormal operations compared to that for normal operations could also potentially reduce the search area in the event of a crash, aiding in the location of the aeroplane. As there is no requirement for aeroplanes delivered before 1 January 2021 to be retrofitted with Distress Tracking solutions, operators may see benefit in implementing aircraft tracking capabilities for abnormal operations to bridge that gap.

2.3 It is therefore likely that some operators would opt to implement aircraft tracking during abnormal operations in conjunction with the requirement for aircraft tracking during normal operations from 8 November 2018 onwards. Unlike ADT where the performance specifications for the triggering criteria are defined in EUROCAE ED-237 document, there are currently no SARPs or minimum guidance on aircraft tracking during abnormal operations. Operators would therefore have to define their own triggering criteria, transmission rate, etc. In addition, there will be a need to establish coordination procedures between the operator and the relevant ATS / SAR entities when an aircraft encounters an abnormal situation. Such procedures would alert and guide ATS / SAR entities on their response to operators' requests for assistance should the abnormal events escalate into a distress event. In view of the above, it would be beneficial for ICAO to expedite the development of guidance material for aircraft tracking during abnormal operations. This would assist States and their operators in their implementation of aircraft tracking.

2.4 This paper was presented at, and supported by the Sixth Meeting of the Regional Aviation Safety Group – Asia and Pacific Regions (RASG-APAC/6).

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