



ASSEMBLY — 42ND SESSION

TECHNICAL COMMISSION

Agenda Item 24: Aviation Safety and Air Navigation Priority Initiatives

IMPLEMENTING THE ELT FOR DISTRESS TRACKING (ELT(DT)) IN SUPPORT OF THE GLOBAL AERONAUTICAL DISTRESS AND SAFETY SYSTEM (GADSS)

(Presented by International Satellite System for Search and Rescue (International Cospas-Sarsat Programme)))

EXECUTIVE SUMMARY

The emergency locator transmitter for distress tracking (ELT(DT)) represents a critical advancement in aviation safety, providing enhanced distress tracking capabilities that will significantly improve search and rescue (SAR) response effectiveness. By enabling continuous position transmission during in-flight emergencies, ELT(DT)s will reduce search areas and accelerate rescue operations, directly supporting ICAO's Global Aeronautical Distress and Safety System (GADSS) objectives.

Civil aviation authorities, airlines, aircraft manufacturers, SAR services and aircraft maintenance facilities should be aware of the differences between the new ELT(DT) and the traditional ELT and strive to ensure that the ELT(DT) is not inadvertently activated in a non-distress situation. This could burden the civilian aviation authorities, airline operators, air traffic services units and rescue coordination centres.

Action: The Assembly is invited to request the Council to urge Member States to mitigate non-distress activations of ELT(DT)s through coordinated efforts from civil aviation authorities, airline operators, aircraft manufacturers, maintenance facilities.

<i>Strategic Goals:</i>	This working paper relates to Strategic Goal <i>Every Flight is Safe and Secure</i> .
<i>Financial implications:</i>	Not applicable.
<i>References:</i>	Annex 6 — <i>Operation of Aircraft</i> , Part I — <i>International Commercial Air Transport — Aeroplanes</i> , 6.18 Location of an aeroplane in distress.

1. INTRODUCTION

1.1 ICAO requirements

¹ English, Arabic, Chinese, French, Russian and Spanish versions provided by Cospas-Sarsat.

1.1.1 Annex 6 — *Operation of Aircraft*, Part I — *International Commercial Air Transport — Aeroplanes*, section 6.18.1 mandates that as of 1 January 2025, all aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2024, shall autonomously transmit information from which a position can be determined by the operator, at least once every minute, when in distress, in accordance with Appendix 9. Section 6.18.3 requires operators to make position information of a flight in distress available to the appropriate organizations, as established by the State of the Operator.

1.2 ELT(DT) development

1.2.1 In 2022, International Satellite System for Search and Rescue (International Cospas-Sarsat Programme) granted the first type approval for an emergency locator transmitter for distress tracking (ELT(DT)), specifically designed to support ICAO's Global Aeronautical Distress and Safety System (GADSS) requirements for autonomous distress tracking (ADT).

2. ELT(DT) OPERATIONAL CONCEPT

2.1 Enhanced capabilities

2.1.1 The ELT(DT) represents a significant advancement over traditional ELTs. While conventional ELTs activate upon impact to locate crash sites, ELT(DT)s activate within seconds of detecting distress conditions in-flight and transmit accurate position information at least every minute, enabling proactive search and rescue (SAR) response, even while the aircraft is still airborne. A crash site can be located within a relatively small radius (i.e., within the six nautical miles stated in the purpose and scope of Annex 6, Part I, Appendix 9), reducing the search area.

2.2 ELT(DT) activities

2.2.1 ELT(DT)s can be:

- a) manually activated by the flight crew;
- b) automatically activated in flight using criteria adopted by civilian aviation authorities (guidance regarding in-flight event detection and triggering criteria developed by EUROCAE may be found in document ED-237), including unusual attitude, unusual speed conditions, total loss of thrust/propulsion on all engines, collision with terrain, ground proximity warnings or other predefined distress indicators, which can be used to detect an in-flight aircraft distress event; and
- c) automatically activated by the internal G-switch triggered by crash, for crash-survivable ELT(DT);

2.2.2 Activation in flight when the aircraft is in a distress condition allows early planning and response by air traffic services (ATS) units and SAR services.

2.3 Data distribution architecture

2.3.1 Cospas-Sarsat ensures global coverage and reliable data (Figure 1) of ELT(DT):

- a) directly to SAR authorities, which are normally rescue coordination centres (RCCs) or defined SAR points of contact (SPOCs); and
- b) via the ICAO Location of an Aircraft in Distress Repository (LADR) to properly subscribed aircraft operators, ATS units, RCCs, and other entities as identified by the State of the Operator.

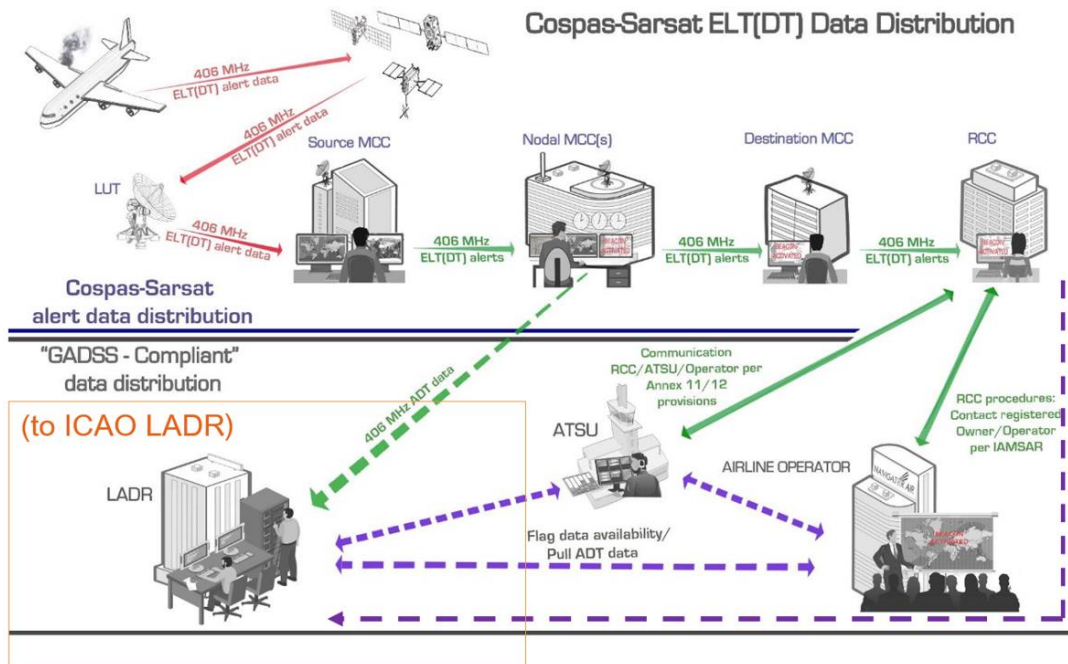


Figure 1. ELT(DT)s transmit via the Cospas-Sarsat satellite system, ensuring that alert data are distributed directly to SAR authorities as well as to the ICAO LADR.

2.3.2 The ICAO LADR, operated by EUROCONTROL, serves as a central ADT data repository, meeting ICAO requirements for making ADT data, including the last known position of an aircraft in distress, available to designated stakeholders. ATS units and RCCs are required by Annex 11 — *Air Traffic Management* and Annex 12 — *Search and Rescue* to establish login credentials for the ICAO LADR, and should adapt their operating procedures and practices to integrate ELT(DT) data into their protocols, noting that it may originate from an aircraft still in flight. The following resources are recommended:

- a) *International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual* (Doc 9731);
- b) *Manual on Global Aeronautical Distress and Safety System* (Doc 10165); and
- c) *RCC Handbook* (document C/S G.007), available free-of-charge at <https://www.cospas-sarsat.int/en/documents-pro/system-documents/system-documents>.

3. ELT(DT) TECHNICAL SPECIFICATIONS

3.1 Key performance features

3.1.1 The key performance features of an ELT(DT) include: rapid data availability (transmission begins within 5 seconds of activation), enhanced transmission schedule (i.e., following activation, every 5 seconds for the first 120 seconds, followed by every 10 seconds between 2 and 5 minutes, then at least every 30 seconds thereafter), GNSS positioning (accurate satellite position data with each transmission), extended operation (minimum 370 minutes autonomous duration if disconnected from the aircraft power), cancellation capability (transmission of a cancellation message when distress conditions normalize), optionally crash survivability (can be designed to withstand crash conditions and continue operation, meeting requirements from other organisations (e.g., EASA) as well as ICAO requirements for a traditional ELT).

3.2 Integration options

3.2.1 Major aircraft manufacturers have integrated ELT(DT)s, including those with automatic deployable flight recorders, enabling independent distress detection, early availability of flight recorder data, and enhanced accident investigation capabilities.

4. OPERATIONAL CHALLENGES AND MITIGATION

4.1 Non-distress activations

4.1.1 Cospas-Sarsat has identified a significant operational challenge: globally, approximately five non-distress activations of ELT(DT)s per day, burdening stakeholders and reducing system effectiveness. Cospas-Sarsat is working with major stakeholders with a goal of reducing the rate of these inadvertent activations which have been seen to be mainly due to human factors, i.e., independent of the operation of the ADT device.

4.2 Stakeholder responsibilities

4.2.1 Effective mitigation of non-distress activations of ELT(DT)s requires coordinated efforts from civil aviation authorities, airline operators, aircraft manufacturers and maintenance facilities.

5. CONCLUSION

5.1 Civil aviation authorities, airlines, aircraft manufacturers, SAR services and aircraft maintenance facilities should be aware of the differences between the new ELT(DT) and the traditional ELT and strive to ensure that the ELT(DT) is not inadvertently activated in a non-distress situation, in particular during maintenance procedures.

5.2 Effective mitigation of non-distress activation of ELT(DT)s is essential to avoid burdening civilian aviation authorities, airline operators, ATS units and RCCs. This requires coordinated procedures and awareness among all stakeholders to minimize inadvertent activations.