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GUIDANCE FOR SEARCH AND RESCUE SERVICES REGARDING IMPLEMENTATION OF AUTONOMOUS DISTRESS TRACKING (ADT) OF AIRCRAFT IN FLIGHT

1 The Sub-Committee on Navigation, Communications and Search and Rescue (NCSR), at its tenth session (10 to 19 May 2023), noted the full implementation of Autonomous Distress Tracking (ADT) of aircraft in flight as part of the International Civil Aviation Organization (ICAO) Global Aeronautical Distress and Safety System (GADSS).

2 The Sub-Committee noted also that relevant information on this matter had been included in the 2022 edition of the IAMSAR Manual.

3 Having considered the need to circulate information to search and rescue (SAR) services regarding the full implementation of ADT of aircraft in flight, the Sub-Committee approved guidance for SAR services, as set out in the annex.

4 Member States are invited to bring this circular to the attention of SAR authorities and services.

5 This circular supersedes COMSAR.1/Circ.59.

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ANNEX

GUIDANCE FOR SEARCH AND RESCUE SERVICES REGARDING IMPLEMENTATION OF AUTONOMOUS DISTRESS TRACKING (ADT) OF AIRCRAFT IN FLIGHT

Purpose and scope

1 This Guidance is intended to provide basic information on Autonomous Distress Tracking (ADT) of aircraft in flight as part of the International Civil Aviation Organization (ICAO) Global Aeronautical Distress and Safety System (GADSS). Further guidance is available in the IAMSAR Manual Volumes I and II.

2 The key stakeholders involved in ADT implementation are:

.1 Air Traffic Service Units (ATSUs);

.2 Aircraft Operators (airline companies, not the crew);

.3 ADT service providers; and

.4 Search and rescue (SAR) services.

Autonomous Distress Tracking

3 ICAO considers the ADT as a notification that an aircraft is in a "distress condition", initially handled at the alert phase unless additional information indicates otherwise. The ADT capability requires the automatic triggering and transmission of distress data when the aircraft is in a condition which, if left uncorrected, is likely to result in the crash of the aircraft. Aircraft position information will be transmitted automatically at least once every minute when the aircraft is in a distress condition. The initial transmission should commence no later than five seconds after the detection of the activation event. Pilots may also manually activate an ADT.

4 It is expected that there will be few ADT-generated notifications when the system commences operating since only newly built commercial aeroplanes with a Maximum Take-Off Mass (MTOM) above 27,000 kg are required to be outfitted, although ICAO recommends smaller aircraft over 5700 kg MTOM be equipped, and operators may decide to retrofit their older aircraft. The ADT device is to activate in flight by automatic triggers that indicate a very high probability of an imminent crash or ditching (in addition to manual activation).*

5 An ADT device can only be deactivated by the same mechanism that activated it (automatically deactivated if activated by automatic means, or crew deactivated if activated by crew).

6 To provide an incentive for ADT installation and to encourage retrofit by older aircraft, ICAO Annex 6 – *Operation of Aircraft, Part I – International Commercial Air Transport – Aeroplanes* was amended to include a note allowing an ADT device to replace the automatic ELT. The possible unintended consequence is that some aircraft may no longer be equipped with an automatic 121.5-MHz homing transmitter since an ADT device is not required to have a post-crash homing transmitter.

* A distress notification can be triggered using criteria that may vary as a result of aircraft position and phase of flight. Further guidance regarding in-flight event detection and triggering criteria may be found in the EUROCAE ED-237, Minimum Aviation System Performance Specification (MASPS) for Criteria to Detect In-Flight Aircraft Distress Events to Trigger Transmission of Flight Information.

7 There are two high-level functional objectives for an ADT system. These are to:

.1 receive timely notice of an aeroplane in a "distress condition" to facilitate timely SAR operations; and

.2 locate an accident site within a 6 NM radius after a crash, based on last known position of the aircraft.

Location of an Aircraft in Distress Repository

8 The ADT device will provide information to positively identify the aircraft and provide the last known position to the ICAO Location of an Aircraft in Distress Repository, (LADR). This includes:

.1 latitude and longitude;

.2 date and time (both transmission and receipt);

.3 operator 3-letter designator (3LD); and

.4 aircraft identification (aircraft nationality and registration mark, 24-bit address, etc.).

9 Additional data intended to assist SAR with their recovery efforts can also be optionally retained, including:

.1 altitude;

.2 groundspeed;

.3 heading;

.4 ELT(DT) Hex ID; and

.5 activation method (manual, automatic, parameter exceedance triggering).

ADT devices

10 ICAO intentionally did not specify a technology for the ADT capability, accordingly multiple technical solutions exist, thus SAR Authorities and services should be mindful that they may receive ADT alerts from sources other than Cospas-Sarsat.

11 For activated ADT devices, the current SAR alerting (ICAO Annex 11) procedures used by Air Traffic Services will be applied and verified distress events reported to the appropriate RCC(s). The responsible ATS unit and the aeroplane operator (per ICAO Annexes 11 and 12) should provide the RCC with further information about the distress event. The contact information for both ATS unit and operator should be available within the ICAO Ops Control Directory and/or be listed in the RCC documentation and plans.

12 Cospas-Sarsat has developed an ELT Distress Tracking (ELT(DT)) device as its ADT solution, which has been selected by major aircraft manufacturers. The Cospas-Sarsat system was declared fully operational for ELT(DT)s that use the current generation beacon technology in January 2023. Cospas-Sarsat will distribute the ADT notifications from the ELT(DT) to the LADR, and also directly to the relevant RCCs under its existing procedures for ELT alerts transmitted at 406 MHz.

> **Note:** The triggering at impact with ground or sea of an automatic ELT or the triggering of an ELT-S (survival) will be routed to RCCs according to the established Cospas-Sarsat Data Distribution Plan.

Interim RCC Procedures for ELT(DT) Devices

13 Until the LADR becomes available, SAR authorities should consider developing interim procedures to appropriately respond to distress ELT(DT) messages emanating from an aircraft still in flight to supplement existing SAR procedures. RCCs should note that the responsibility for coordinating aircraft in-flight emergencies continues to be retained by ATS while the aircraft is airborne. RCC actions to be taken after receipt of a SIT 185 message from an ELT(DT) could include the following:

.1 Note that the Cospas-Sarsat SIT 185 message reports the detection of a signal from the new beacon type, the ELT(DT); paragraph 1 of the SIT 185 message contains "DISTRESS TRACKING" and paragraph 3 clearly identifies the source of the message as "ELT DISTRESS TRACKING".

.2 Study the basic event information provided in the ELT(DT) SIT 185 message:

.1 paragraph 3 will provide two identities, namely:

.1 the country/region where the aircraft is registered, as included in the 24-bit address, which should be used when communicating with ATSUs; and

.2 the country/region where the ELT(DT) is registered, as included in the beacon Hex ID, which should be used when communicating with RCCs/SPOCs.

.2 paragraph 4 will provide the aircraft position.

.3 Per current RCC/ATS coordination procedures, the responsible aeronautical RCC or JRCC contacts the appropriate ATS unit(s) and the operator per ICAO Annexes 11 and 12 to exchange further information about the possible (or confirmed) distress event. The contact information for both ATS unit and operator should be available within the ICAO Ops Control Directory and/or be listed in the RCC documentation and plans. For ELT(DT) activations over maritime areas, and where there is no JRCC established, the responsible ARCC should notify its partner MRCC.

.4 If necessary, request that the sending MCC send more of the data stored at the MCC level for the beacon event, to allow tracking of the flight using all (or more) of the information transmitted by the ELT(DT).

.5 Contact your supporting MCC for any necessary clarifications about the content of a SIT 185 message.

.6 Pending verification from ATS, prepare for a potential SAR operation per normal SAR procedures, while monitoring incoming messages for a possible cancellation message (in a SIT 185 Cancellation Message, Paragraph 1 contains "DISTRESS TRACKING COSPAS-SARSAT USER CANCELLATION ALERT").

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