Civil Aviation Safety Authority
of Papua New Guinea

Advisory Circular

AC91-31

Global Aeronautical Distress Safety Systems (GADSS) and Location of Aircraft In Distress Repository (LADR)

Original

31 October 2024

GENERAL

Civil Aviation Safety Authority Advisory Circulars (AC) contain information about standards, practices and procedures that the Director has found to be an **Acceptable Means of Compliance (AMC)** with the associated rule.

An AMC is not intended to be the only means of compliance with a rule, and consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices or procedures are found to be acceptable, they will be added to the appropriate Advisory Circular.

This Advisory Circular also includes **Explanatory Material (EM)** where it has been shown that further explanation is required. Explanatory Material must not be regarded as an acceptable means of compliance.

PURPOSE

This Advisory Circular provides methods, acceptable to the Director, for showing compliance with the requirements of Rule 43.66 relating to Non-Destructive Testing and provides explanatory material to assist in showing compliance.

RELATED CAR

This AC relates specifically to Civil Aviation Rule Part 91.531.

CHANGE NOTICE

This AC is the Original and there is no change notice.

APPROVAL

This AC has been approved for publication by the Director of Civil Aviation.

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1. EM 91.531 Introduction

This AC provides guidance on locating an airplane in distress as required by rule 91.531 and Part 91 Appendix E, in order to comply with ICAO Annex 6 Part I paragraph 6.18.

Following several accidents where downed aircraft could not be located at all, or only after long and expensive search efforts, the Global Aeronautical Distress and Safety System (GADSS) recommendations were adopted by the International Civil Aviation Organization (ICAO) in March 2016. ICAO Standards and Recommended Practices (SARPS), support the goal of improving aircraft tracking and identifying distress situations during the flight, when it is still possible to track the aircraft and initiate a timely rescue operation.

The ICAO Triggered Transmission of Flight Data Working Group (TTFDWG) reviewed forty-two accidents to determine an indication of the distance from a last-known aeroplane position to the location of an accident site. The report concluded that in approximately 95 per cent of the cases, when the aircraft position was known one minute prior to the accident, the accident site location was within a 6 NM radius of that position.

When an aeroplane has an accident into water and becomes submerged, the location of the accident site within a 6 NM radius on the surface becomes more important. Starting the initial search area beyond a 6 NM radius reduces the amount of time available to search for and locate the aeroplane. At current estimated underwater search capabilities of 100 km2/day, an area with a 6 NM radius could be searched in four days.

Allowing for naval assets to reach the search area and conduct the search, it is estimated that an area of 2 300 km2, equivalent to a radius of 14 NM, will be able to be searched before the ULD battery degrades. Starting at an area of more than 6 NM radius reduces the probability of a successful location during an initial search, whilst extending the location requirement beyond 6 NM radius reduces the time available to search with no appreciable gain in the probability of recovery.

ICAO requirements anticipate that most commercial aircraft (subject to its jurisdiction, e.g., on international routes) that are delivered on or after 1 January 2024 will be equipped with an ELT(DT) (or comparable device). It is expected that the first operational ELT(DT)s could be in flight from Q4/2022.

3. EM 91.531(a) Purpose

A new beacon type, the ELT (DT) [ELT for Distress Tracking] was developed to support ICAO's GADSS. ELT (DT) will activate while an aircraft is still in flight if certain distress conditions are detected, necessitating handling by SAR authorities of alerts in ways that might be different from legacy ELTs.

The purpose of this AC is to:

(i) Alert Part 121 Air Operators to the new tracking requirements promulgated in rule 91.531 and Part 91 Appendix E. These requirements are transposed from ICAO Annex 6 Part I section 6.18 and ICAO Doc 8168 PANS OPS section 10 chapter 2 which will be applicable from **01 January 2025**.

(ii) Provide information and support to the SAR Authorities on GADSS, its functions, the LADR system and the handling of ELT(DT) messages.

3. EM 91.531(a) Objectives

A key aspect of GADSS is autonomous distress tracking (ADT), applicable to most commercial aircraft over 27000kg MCTOM, which is to:

(i) ensure timely detection of aircraft in distress, to facilitate confirmation of the distress condition and timely preparation for SAR action.

(ii) Ensure tracking of aircraft in distress and timely and accurate location of end of flight, to accurately direct SAR actions.

(iii) Enable effective and efficient SAR operations.

(iv) Ensure timely retrieval of the Flight Data Recorder (FDR).

4. List of Acronyms

For the purposes of this AC, the following acronyms apply:

ADT -Autonomous Distress Tracking

AO – Aeroplane Operators.

ATSU – Air Traffic Service Unit

DT – Distress Tracking

FIR – Flight Information Region

GADSS – Global Aeronautical Distress Safety System

ELT – Emergency Locator Beacon

ICAO – International Civil Aviation Organisation

LADR – Location of an aircraft in Distress Repository

MCTOM – Maximum Certificated Take-Off Mass

OPS CNTRL – OPS Control Directory

RCC – Rescue Coordination Centre

SAR - Search and Rescue Services

5. EM 91.531(b) Location of an Aircraft in Distress Repository (LADR)

5.1 What is LADR?

The LADR has been developed by the European Organization for the Safety of Air Navigation (EUROCONTROL) in close cooperation with ICAO. The initial operational phase of the LADR has been delivered to meet the minimum required functions, and further developments are expected throughout 2024 to transition the system to full operational capability. Nevertheless, the current system fulfils the basic requirements to store and display position information and notify registered users when new information becomes available.

The LADR is intended to serve as a central position for storing and accessing the last known position of an aircraft in distress. The position may be made available from a number of different proprietary systems that meet the requirements of the standards of ICAO Annex 6. The LADR will provide a single point of access and standard format for this information.

5.2 What can LADR not provide?

The LADR does not provide alerting of distress conditions. This will be done by Air Operators and ATSUs using the existing provisions of ICAO Annex 6 and Annex 11 – Air Traffic Services. Annex 6 requires the Air Operator to be notified when an aircraft is in distress. The Air Operator should use this information to supplement its existing procedures and either validate the distress event or establish contact with the crew to confirm the safety of the aircraft.

5.3 Steps to take if an aircraft distress condition is confirmed or suspected?

In the event that a distress condition is confirmed or suspected, the Air Operator will contact the Air Traffic Control center which remains responsible for the activation of the alerting service and establishment of the relevant alert phase (uncertainty – INCERFA; alert -ALERFA; Distress -DETRESFA).

Operational procedures for monitoring and making position information of a flight in distress available to the appropriate organizations in a timely manner are contained in PANS-OPS, Volume III, Section 10.

5.4 What can LADR provide?

The LADR is a system that will allow accredited contributors as listed in Appendix A of this AC, to submit position information of an aircraft in distress or potentially in distress. The system will store information (ie. data that meets the input format guidelines) and provide filters allowing users to access information based on their profile.

5.5 ICAO OPS Control Directory transferred to EUROCONTROL

The OPS CTRL Directory is a means to facilitate communication and exchange of information between air operators and air navigation service providers. OPS CTRL Directory has been developed as a means to implement the new aircraft tracking standards developed by ICAO.

The OPS Control Directory contains operational contact details of Air Operators, Area Control Centers, and Rescue Coordination Centers to assist with coordination in the event of an aircraft accident or incident. Appropriate SAR Authorities will be able to request a free subscription to the LADR through the Ops Control Directory.

The OPS Control Directory formerly hosted by ICAO, was transferred to EUROCONTROL and is now included as a function within LADR. OPS CTRL acts as a means by which users will be authorized for the use of LADR. The LADR can be accessed through the following url link:
https://ladr.eurocontrol.int/ops/frontend

6. EM 91.531 PNG'S READINESS FOR GADSS/LADR

6.1 Aircraft Equipage for Autonomous Distress Tracking

The arrival of new aircraft equipped with autonomous distress tracking devices, raises the need for Part 121 air operators, ATSUs and SAR Service providers to be prepared to receive and respond to ADT alerts and notifications. ICAO has circulated a survey in ICAO State letter AP128-22 (Appendix A), which is intended to:

(i) gauge regional and PNG's readiness for ADT; and
(ii) serve as a Checklist of considerations for the relevant State Authorities.

Appendix A – ICAO Survey of State of Readiness for Autonomous Distress Tracking (ADT)

The following SAR Administration are requested to use the survey as a checklist to check the progress of their readiness for receiving and handling of ADT Alerts.

1. CASA PNG as Aviation Regulatory Authority
2. Air Operators (Annex 6 Part I)
3. SAR Service Providers
4. Air Navigation Service Providers

AVIATION REGULATORY AUTHORITY (CASA PNG)		
Tick the box if the State has:		
1	☐	Registered a State focal point in the EUROCONTROL/ICAO OPS CTRL DIRECTORY Email: aircrafttracking@icao.int Website url: https://www4.icao.int/opsctrl/
2	☐	Taken action to ensure and facilitate the registration of all relevant organizations in the OPS CTRL Directory
3	☐	Recorded the required operational contact details in the OPS CTRL Directory
4	☐	Identified the relevant entities and ensured that they are prepared to subscribe to LADR notifications when the service is commissioned
5	☐	Developed regulations requiring air operators to comply with ICAO Annex 6 Part I section 6.18
6	☐	Ensure the incorporation of procedures for ADT Notifications, and verification by air operators, in existing procedures for ATS alerting services
7	☐	Ensure the development of procedures for RCC actions in response to ADT notifications
8	☐	Ensure the development of procedures for RCC actions in response to ELT (DT) alerts via the COSPAS-SARSAT system
9	☐	Incorporated ADT considerations in procedures and manuals for safety oversight of aircraft operators, ANSPs, and SAR Service Organizations.
10	☐	Published and Promulgated educational material on ADT for aircraft operator, ATSU, RCC personnel and other relevant stakeholders

AIRCRAFT OPERATOR (PART 121)		
Tick the box if the AIRCRAFT OPERATOR has:		
1	☐	Registered in the EUROCONTROL/ICAO OPS CTRL DIRECTORY Email: aircrafttracking@icao.int Website url: https://www4.icao.int/opsctrl/
2	☐	Commenced preparation for subscription to LADR notifications, when the service is commissioned.
3	☐	Developed procedures for the initial aircraft operator response to ADT Notifications
4	☐	Developed procedures for the initial aircraft operator response to ELT(DT) Alert coordination received from SAR Authorities or ATSUs
5	☐	Trained Flight Dispatch and other relevant personnel to understand ADT Notifications and ELT (DT) Alerts (according to its fleet equipage) and to execute ADT procedures accordingly
6	☐	Developed procedures for informing appropriate ATS Units of the outcome of ADT validation checks

SAR Service Provider (RCC/RSC)		
Tick the box if the Air Navigation Service Provider has:		
1	☐	Registered in the EUROCONTROL/ICAO OPS CTRL DIRECTORY Email: aircrafttracking@icao.int Website url: https://www4.icao.int/opsctrl/
2	☐	Commenced preparation for subscription to LADR notifications, when the service is commissioned.
3	☐	Developed procedures for the initial aircraft operator response to ADT Notifications
4	☐	Developed procedures for the initial response to ELT(DT) alerts
5	☐	Developed procedures for the use of LADR
6	☐	Trained SAR personnel to understand ADT notifications and ELT(DT) alerts, and to execute ADT procedures accordingly.

Air Navigation Service Provider (RCC/RSC)		
Tick the box if all relevant ATS Units have:		
1	☐	Registered in the EUROCONTROL/ICAO OPS CTRL DIRECTORY Email: aircrafttracking@icao.int Website url: https://www4.icao.int/opsctrl/
2	☐	Commenced preparation for subscription to LADR notifications, when the service is commissioned.
3	☐	Provided for LADR access to the relevant operational supervisory position in the ACC in charge of each FIR, when the service is commissioned
4	☐	Developed procedures for the response to ADT notifications received from aircraft operators.
5	☐	Developed procedures for the response to ELT(DT) coordination received from SAR authorities.
6	☐	Trained relevant ATS personnel to understand ADT notifications and ELT(DT) alerts, and to coordinate in accordance with procedure.

Appendix B – Other Reference Materials

ICAO Annex 6 *Operation of Aircraft* Part I
ICAO Annex 11 Air Traffic Services
ICAO Annex 12 *Search and Rescue*
ICAO Annex 13 *Accident and Incident Investigation*
ICAO Doc 4444 *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM)
ICAO Doc 100542 *Manual on Location of Aircraft in Distress and Flight Recorder Data Recovery*
ICAO Doc 10165 Global Aeronautical Distress and Safety System (GADSS) Manual (NEW)
Expected availability Q3/Q4 2022
International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual Volumes I and II
ICAO Asia/Pacific Regional SAR Plan Version 4.0
Subject to approval by the Tenth Meeting of the ATM Sub-Group of APANPIRG, November 2022
ICAO Web Resources:
Global Tracking Initiatives
https://www.icao.int/safety/OPS/OPS-Section/Pages/Global-tracking.aspx
Update on GADSS-Related Global Aircraft Tracking Initiatives
https://www.icao.int/safety/globaltracking/Pages/GADSS-Update.aspx
ICAO Skytalk: GADSS Implementation Support Tools
https://www.youtube.com/watch?v=ZbD3IIdkzbk
ICAO OPS Control Directory
https://www4.icao.int/opsctrl/
Cospas-Sarsat Documentation:
C/S A.001 (data distribution procedures for ELT(DT)s)
C/S A.002 (structure and samples of ELT(DT) distress alert messages sent to SPOCs)

C/S T.001 and C/S T.018 (respectively, FGB and SGB (ELT(DT) specifications)
C/S G.007 (RCC handbook)