CIVIL AVIATION AUTHORITY OF FIJI

GUIDANCE MATERIAL

GLOBAL AERONAUTICAL DISTRESS SAFETY SYSTEM (GADSS) and LOCATION OF AN AIRCRAFT IN DISTRESS REPOSITORY (LADR)

GM – GADSS and LADR

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PREFACE

This Guidance Material (GM) is published by the Civil Aviation Authority of Fiji for purposes of promulgating supplementary material to that published in the Authority's Standards Documents.

This GM provides guidance to the Air Traffic Services Provider (ATSP), to comply with the GADSS requirements under SD-SAR for SAR personnel who will be responsible for the implementation of the GADSS requirements.

This GM explains certain regulatory requirements by providing interpretive and explanatory material.

Chief Executive
Civil Aviation Authority of Fiji

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1. INTRODUCTION

1.1. 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. These recommendations, 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.

2. DESCRIPTION

2.1. A new beacon type, the ELT(DT) (ELT for distress tracking) was developed to support ICAO's Global Aeronautical Distress and Safety System (GADSS). ELT(DT)s 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.

2.2. 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).

3. OBJECTIVES

3.1. A key aspect of GADSS is autonomous distress tracking (ADT), applicable for most commercial aircraft (those over 27,000 kg maximum take-off mass), which is to:

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

b) ensure tracking of aircraft in distress and timely and accurate location of end of flight, to accurately direct SAR actions,

c) enable efficient and effective SAR operations,

d) ensure timely retrieval of Flight Recorder Data.

4. PURPOSE

4.1. The purpose of this GM is to:

a) Alert air operators of aircraft of new tracking requirements issued under the International Civil Aviation Organization (ICAO) Standards and Recommended Practices (SARPs), Annex 6 – Operation of Aircraft, Part I section 6.18 and ICAO DOC 8168 PANS OPS Section 10 Chapter 2 which will be applicable 01 January 2025.

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

5. LIST OF ACRONYMS

ADT – Autonomous distress tracking
AO – Aeroplane Operators
ATSU – Air Traffic Service Unit
DT – Distress Tracking
GADSS – Global Aeronautical Distress Safety System
ELT - Emergency Locator Beacon
LADR – Location of an Aircraft in Distress Repository
OPS CTRL – Ops Control Directory
RCC – Rescue Coordination Centre
SAR – Search and Rescue Services

6. LOCATION OF AN AIRCRAFT IN DISTRESS REPOSITORY (LADR)

6.1. The proposed Location of an Aircraft in Distress Repository (LADR) is intended to serve as a central location for storing and accessing the last known position of an aircraft in distress.

6.2. The LADR will provide a single point of access and standard format for this information.

6.3. The LADR does not provide alerting of distress conditions, this will be done by operators and Air Traffic Service Units (ATSUs) using the existing provisions of Annex 6 and Annex 11— Air Traffic Services.

6.4. ICAO Annex 6 requires the operator to be notified when an aircraft is in distress. The 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 aeroplane.

6.5. In the event that a distress condition is confirmed or suspected, the operator will contact the relevant air traffic control (ATC) center who remains responsible for the activation of the alerting service and establishment of the relevant alert phase (uncertainty (INCERFA), alert (ALERFA), distress (DETRESFA)

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

7. ICAO OPS CONTROL DIRECTORY

7.1. An online OPS Control Directory portal had been established at https://www4.icao.int/opsctrl by ICAO.

7.2. The OPS Control Directory contains operational contact details for aircraft operators, area control centers, and rescue coordination centers, to assist with coordination in the event of an incident.

7.3. Appropriate SAR authorities will be able to request a free subscription to the LADR through the ICAO Ops Control Directory (https://www4.icao.int/opsctrl).

7.4. The ICAO OPS Control Directory is provided to facilitate communication and exchange of information between air operators and ANSPs. It also provides a link to a map depicting ANSP surveillance where position reports are received at less than 15-minute intervals to assist air operators with meeting Aircraft Tracking requirements.

8. AUTONOMOUS DISTRESS TRACKING (ADT)

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

a) receive timely notice of an aeroplane in a distress condition to facilitate timely SAR operations, and

b) locate an accident site with high probability after a crash based on last known position of the aircraft.

8.2. The ADT function would be used to identify the location of an aircraft in distress with the aim of establishing, to a reasonable extent, the location of an accident site within a 6 NM radius. The accuracy of position information shall, as a minimum, meet the position accuracy requirements established for Emergency Locator Transmitters (ELTs).

8.3. It is important to note that there was not expected to be many ADT-generated notifications at the beginning of operations. From 1 January 2021 the Standards and Recommended

Practices (SARPs) of ICAO Annex 6 – Operation of Aircraft, Part I – International Commercial Air Transport – Aeroplanes (11th Edition, July 2018):

a) mandated that newly manufactured aircraft over 27,000 kg maximum certificated take-off mass to autonomously transmit information from which a position can be determined by the operator at least once per minute when the aircraft is in distress.

b) recommend the same requirement be applicable for defined aircraft over 5,700 kg maximum certificated take-off mass; and

c) require the aircraft operator to make the position information of a flight in distress available to Air Traffic Services Units (ATSUs), Rescue Coordination Centres (RCCs) and any additional entity as established by the State of the Operator.

8.4. The ADT capability requires the automatic triggering and transmission of distress data when the aircraft enters a state 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 shall commence immediately or no later than five seconds after the detection of the activation event. Pilots may also manually activate the ADT. The ADT will only be able to be deactivated by the same mechanism that activated it.

9. DISTRESS TRACKING DATA REPOSITORY (DTR)

9.1. The GADSS Concept of Operations (CONOPS) identified the need to collect, store and provide access to ADT data to notify and assist appropriate stakeholders such as ATSUs and RCCs to locate an aircraft in distress and enhance SAR and recovery capabilities. A centrally managed data repository, the DTR, is considered the preferred means to enable this.

9.2. The DTR is planned by ICAO as a secure web-based storage facility where aircraft ADT data will be communicated and stored to enable the last known position of an aircraft in distress, or potential distress, to be available to authorized stakeholders in a timely manner.

9.3. DTR stakeholders will include DTR Administrators, Contributors and Users. Users will have read-only access. RCCs, as DTR Users, will need to subscribe as an authorized user to access ADT data in the DTR. Other Users will have access to available information according to their profile. For example, Air Operators will only have access to ADT data for their aircraft and ANSPs to ADT data within their Flight Information Region (FIR) and within a planned area 80 NM outside the FIR boundary.

9.4. Subscribers will receive a notification whenever new ADT information relevant to them arrives in the DTR. Subscribers will then need to look in the DTR to access the ADT data. Subscription will be voluntary.

9.5. States will determine who will have access to the DTR data as this is potentially sensitive. For example, an airline will only have access to its own aircraft, and ATSUs will only be able to access information within, or close to their area of responsibility.

10. OPERATIONAL CONSIDERATIONS

10.1. Existing Annex 11 and Annex 12 SARPs between ATSUs and RCCs remain unchanged.

10.2. The ADT system was not intended as a distress alerting system like ELTs. It was intended as a means to identify and notify a distress, or potential distress, condition.

10.3. Upon the triggering of an ADT transmission, the aircraft operator was responsible for validation of the transmission and initial checks, if possible, including attempted contact with the aircraft to confirm the situation. The aircraft operator would then notify the relevant ATSU of the results including if a false activation. The ATSU will declare an emergency phase as appropriate and notify the relevant RCC per existing Annex 11, Chapter 5, Alerting Service.

10.4. DTR notifications would be sent to all affected DTR subscribers. Typically, an initial ADT notification would go to the aircraft operator and the ATSU and RCC associated with the aircraft's position. This was one of the reasons why the establishment of clear areas of responsibility with non-overlapping or separated SRR boundaries was a priority.

10.5. Notwithstanding the responsibility of the aircraft operator, it is highly likely that the ATSU and RCC responsible could already be aware of an in-flight emergency for that aircraft by other alerting means and have already initiated a response. Aircraft operators, ATSUs and RCCs would need to ensure their staff understand each other's roles, responsibilities and processes to ensure clear communication and coordination to avoid, where possible, conflicting effort and unnecessarily increasing workload; hence special training and awareness programmes would be necessary.

Note – States may consider this as part of meeting the expectations of Preferred SAR Capability Specification (PSCS) 7.4 (h) of the ICAO Asia/Pacific SAR Plan, which states that all States should facilitate a programme of regular liaison visits between relevant RCCs, ATC units and airline operating centres in order to understand those organizations, facilities and capabilities.

10.6. More detailed information on GADSS and Global Tracking Initiatives is at the following ICAO HQ webpage: https://www.icao.int/safety/globaltracking/Pages/Homepage.aspx.

11. STATE READINESS

11.1. As of 1 January 2025, all airplanes of a maximum certificated take-off mass of over 27000 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 of Annex 6 Part 1.

11.2. In recognition of the impending equipage of new aircraft with Autonomous Distress Tracking (ADT) devices, and the need for aircraft operators, Air Traffic Service Units (ATSUs) and Search and Rescue (SAR) service providers to be prepared to receive and respond to ADT alerts and notifications.

11.3. ICAO has conducted a survey (refer to Attachment A of this GM) intended to:

a) Gauge regional readiness for ADT, and to

b) serve as a checklist of considerations for the relevant State entity within Fiji.

ATTACHMENT A - SURVEY OF STATE READINESS FOR AUTONOMOUS DISTRESS TRACKING (ADT)

The following SAR Administrations are requested to use the survey as a checklist to check the progress of their readiness for the reception and handling of ADT ALERTS:

1. Aviation Regulatory Authority;
2. Aircraft Operators (Annex 6 Part 1);
3. SAR Service Providers; and
4. Air Navigation Service Providers

AVIATION REGULATORY AUTHORITY		
Check the box if the State has:		
1.	☐	Registered a State Focal Point in the ICAO OPS CTRL Directory (email: aircrafttracking@icao.int website: 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 relevant entities and ensured they are prepared to subscribe to LADR notifications when the service is commissioned
5.	☐	Developed regulations requiring aircraft operator compliance with Annex 6 Section 6.18
6.	☐	Ensured the incorporation of procedures for ADT notifications, and verification by aircraft operators, in existing procedures for ATS alerting services.
7.	☐	Ensured the development of procedures for RCC actions in response to ADT notifications
8.	☐	Ensured 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 and RCC personnel and other necessary stakeholders

AIR OPERATOR		
Check the box if the Air Operator has:		
1.	☐	Registered a State Focal Point in the ICAO OPS CTRL Directory (email: aircrafttracking@icao.int website: https://www4.icao.int/opsctrl/
2.	☐	Taken action to ensure and facilitate the registration of all relevant organizations in the OPS CTRL Directory
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 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)		
Check the box if the Air Navigation Service Provider has:		
1.	☐	Registered a State Focal Point in the ICAO OPS CTRL Directory (email: aircrafttracking@icao.int website: https://www4.icao.int/opsctrl/
2.	☐	Commenced preparation for subscription to LADR notifications, when the service is commissioned.
3.	☐	Developed procedures for the initial response to ADT notifications received from ATS units.
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		
Check the box if the Air Traffic Service (ATS) Units have:		
1.	☐	Registered a State Focal Point in the ICAO OPS CTRL Directory (email: aircrafttracking@icao.int website: 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 services 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.

Reference Material

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)

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)