GADSS AND ELT(DT)s

Cheryl Bertoia
Arnaud Sindou

Cospas-Sarsat Secretariat

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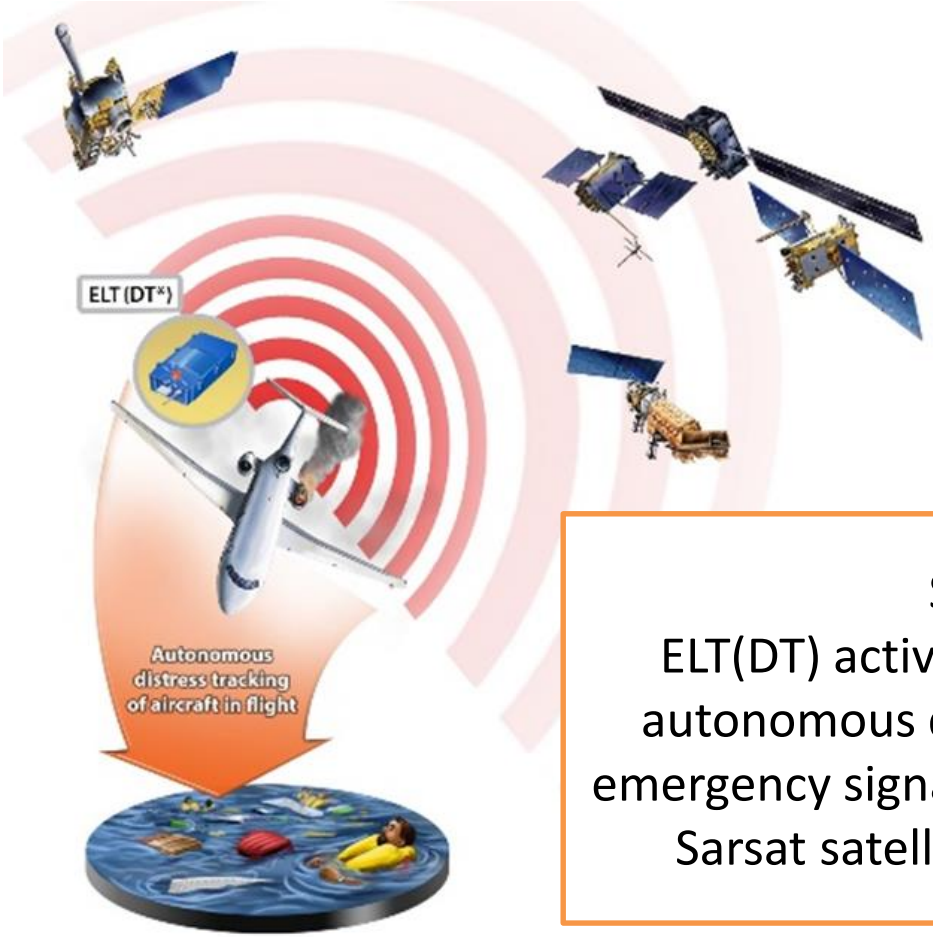
(APSAR/WG/8) *(Bangkok, 22 - 25 May 2023)*

ELT(DT) for Distress Tracking



Scenario #1:
ELT(DT) activates independently upon autonomous detection in-flight aircraft emergency signaling the distress to Cospas-Sarsat satellites (MEOSAR* system).

ELT(DT) Design

- ICAO: ADT is performance based and non-technology specific

Airbus, Boeing, Bombardier, and Embraer (OEMs) have selected the ELT(DT) to satisfy:

- ICAO Annex 6 - GADSS recommendations
- European operational requirements (see ED-237).

ELT(DT) Design

- Linked to aircraft avionics for autonomous activation
- Start transmitting after 5 sec max after activation (ELT = ~ 50 sec)
- Higher transmission rate than regular ELT:
  - Every 5 sec between T= 0 to T=2 min
  - Every 10 sec between T = 2 min to T = 5 min
  - Every 28.5 sec after T = 5 min
- Powered by aircraft; if disconnected, battery for > 370 minutes,
- Cancellation function (when activation criteria are no longer valid)
- Coded with ICAO 24-bit address and Operator 3LD
- Provide GNSS position and altitude
- Do not provide 121.5 MHz in flight
- Not supposed to survive a crash

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ELT(DT) Design

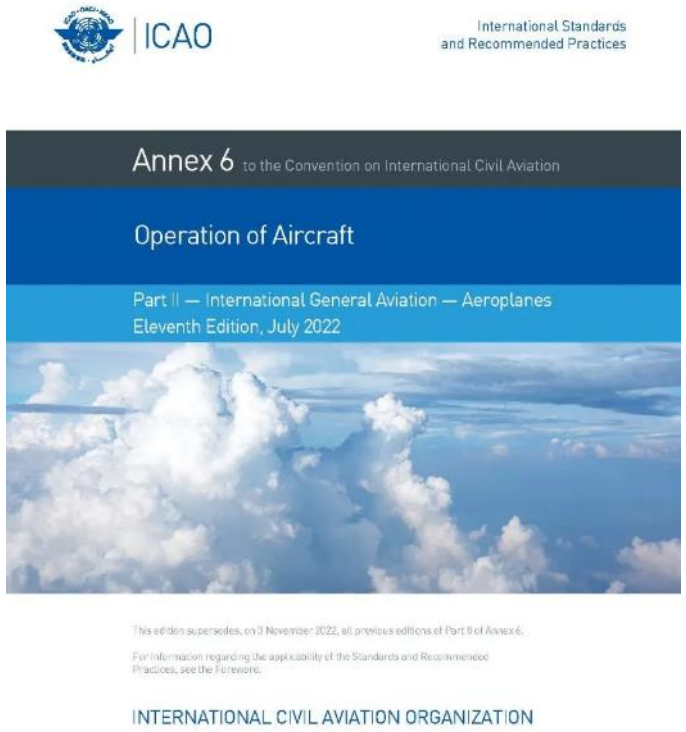
- ELT(DT) designed to withstand a crash impact
  - ELT(DT) before a crash
  - Transmission mode after “crash” detection
    - Every 5 sec between T = Crash and T = 30 min
    - Every 120 sec after T= 30 min
  - Total operating time (in-flight +after crash) >24h
  - Keep same HEX ID
- ELT(DT) combined with automatic ELT
  - ELT(DT) before a crash (>370 min)
  - ELT(Auto)* after a crash (>24h)
    - * 3LD once every 2 bursts for 5 minutes
    - * Cancellation message capability
    - * Keep same ELT(DT) Hex ID

ELT(DT) Readiness

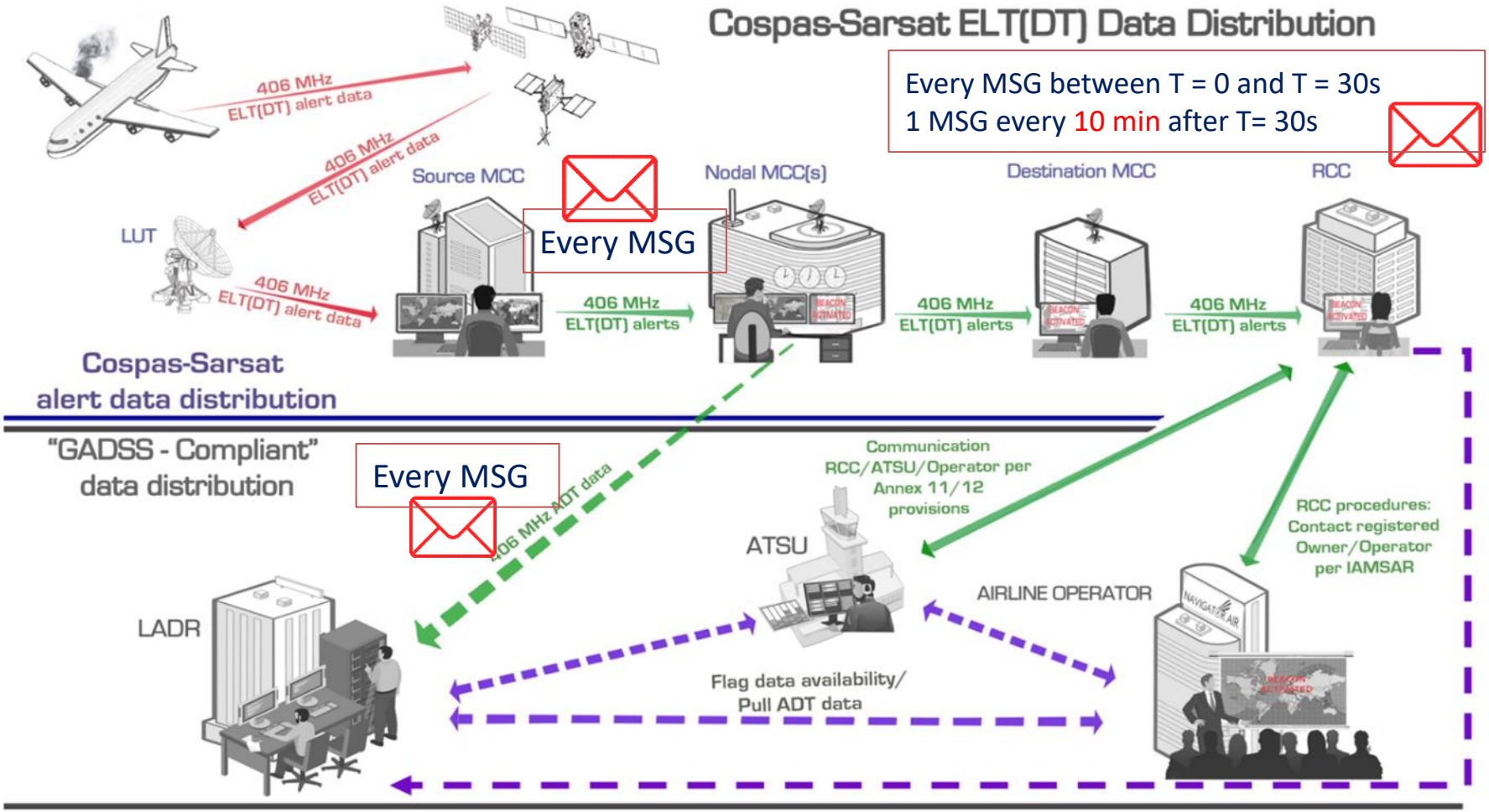
- Required ADT equipage date postponed to 1 Jan 2025
  - applicable to all aircraft over 27,000 kg first issued with a Certificate of Airworthiness from **1 January 2024**.
  - Several major airframers indicated ELT(DT) onboard as early as **March 2023**

=> FGB ELT(DT) was declared at FOC by C/S on 1 Jan. 2023

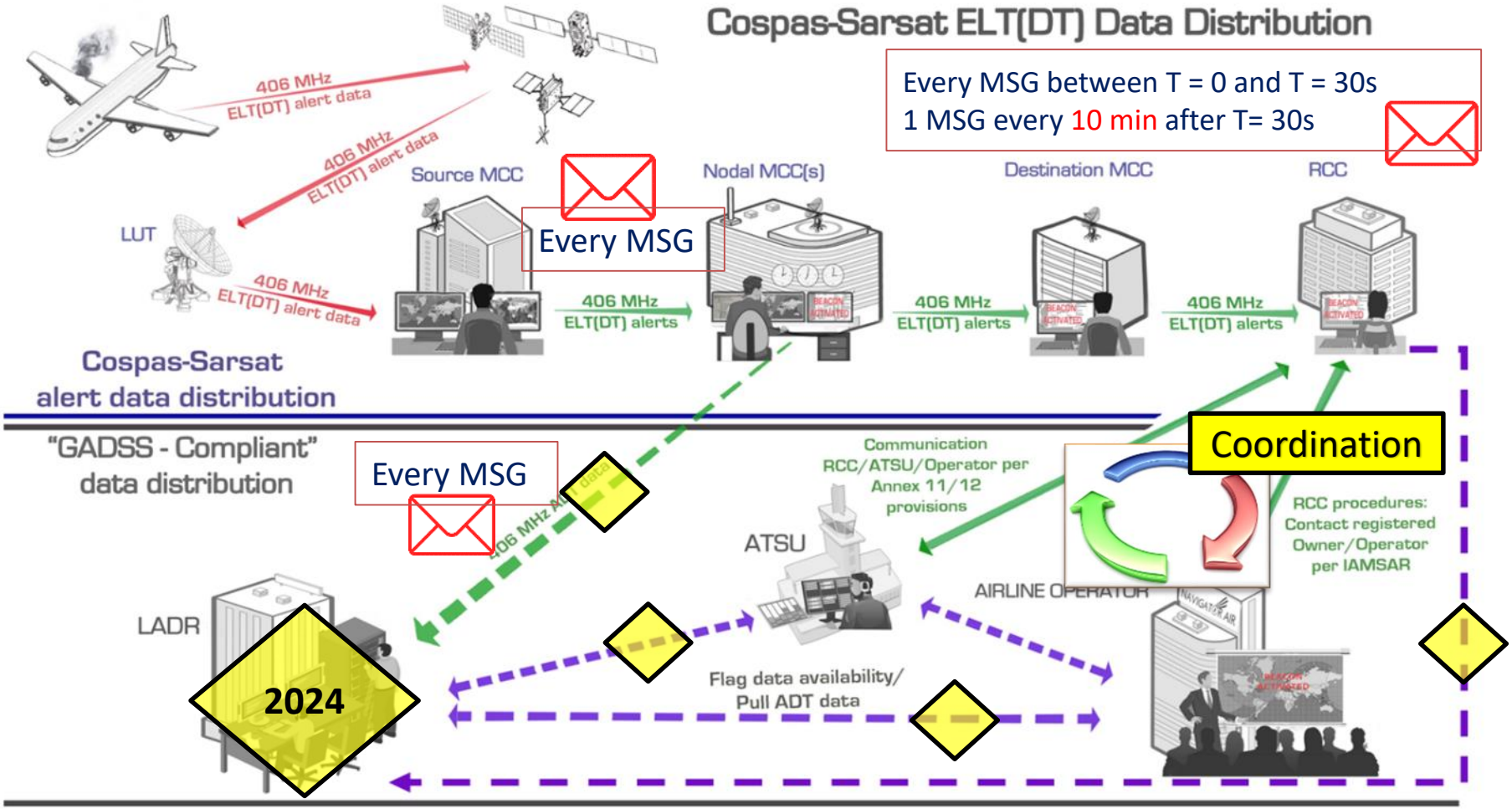
=> SGB ELT(DT) will follow soon



ELT(DT) Data Distribution



ELT(DT) Data Distribution



Guidance to ATS and RCC

1. SIT 185 message also reports the detection of a signal from ELT(DT); Paragraph 1 will contain "**DISTRESS TRACKING**", and Paragraph 3 will clearly identify the source of the message as an "**ELT DISTRESS TRACKING**"

2. Study the basic event information provided in the ELT (DT) SIT 185:
   - Paragraph 3 provides "**flag" State of the aircraft** decoded from the **ICAO 24-bit address,** and the **aircraft operator 3LD** from the rotating field.
   - Paragraph 4 provides the **aircraft position (GNSS)**.

[~~*3. **Login to ICAO's LADR** to access all available information for this distress event, including the aircraft's **last known position** (LKP). [LADR not ready]*~~

3. contact the appropriate **ATSU(s)** (and possibly the airline operator) per ICAO Annexes 11 and 12 to determine more information about the possible distress event, *contact information for both ATS unit and operator should be available within the new Ops Control Directory **[**when ready]* and/or listed in the RCC documentation and plans.

Guidance to ATS and RCC

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).

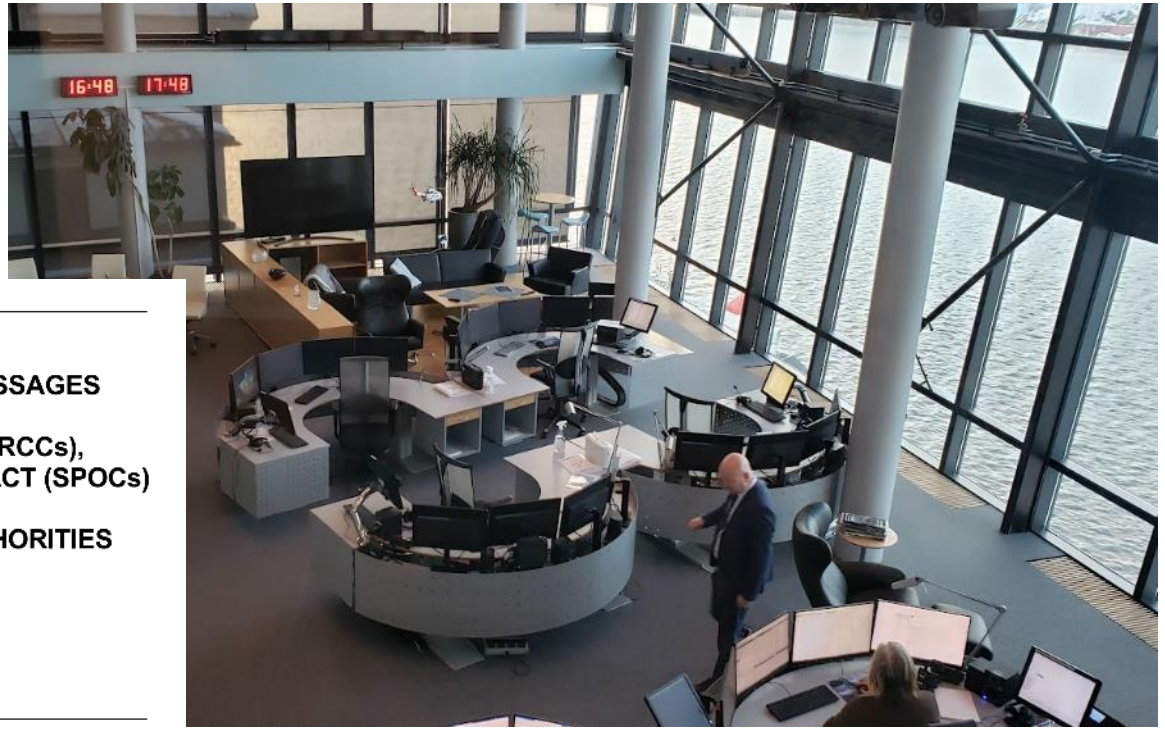
~~*6. Monitor the LKP available in the LADR to assist in determining whether the aircraft is a **fixed or moving target**, in coordination with the appropriate ATSU and neighboring RCCs, as appropriate.*~~ *[LADR not ready]*

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

6. **Prepare for a SAR operation**, while monitoring incoming alerts for a possible cancellation message (SIT 185 **cancellation message**, Paragraph 1 will contain "**DISTRESS TRACKING COSPAS-SARSAT USER CANCELLATION ALERT**").

7. Launch SAR activities per national procedures (and IAMSAR manual guidance)…

Cospas-Sarsat RCC Handbook



HANDBOOK ON DISTRESS ALERT MESSAGES
FOR
RESCUE COORDINATION CENTRES (RCCs),
SEARCH AND RESCUE POINTS OF CONTACT (SPOCs)
AND
IMO SHIP SECURITY COMPETENT AUTHORITIES

C/S G.007
Issue 3
March 2022

Further guidance for RCCs are available in the Cospas-Sarsat RCC Handbook available on the Cospas-Sarsat/Pro website <here>

Annexes

- Sample ELT(DT) SIT 185 message for FGB
- Sample ELT(DT) SIT 185 message for SGG
- Rational for early alerting to RCCs while the aircraft is still in flight.

- **Sample ELT(DT) SIT message**

FGB ELT(DT)

1. **DISTRESS TRACKING** COSPAS-SARSAT DOA POSITION CONFLICT ALERT

2. MSG NO 21013 CMCC REF 1D1200F03BBFDFF

3. BEACON MESSAGE INFORMATION

BEACON TYPE **ELT DISTRESS TRACKING**

AIRCRAFT 24 BIT ADDRESS 01E077 ASSIGNED TO G BRITAIN

AIRCRAFT OPERATOR DESIGNATOR MMB

HEX ID 1D1200F03BBFDFF

COUNTRY OF BEACON REGISTRATION 232/G BRITAIN

ACTIVATION TYPE MANUAL

GNSS POSITION PROVIDED BY EXTERNAL DEVICE

4. ALERT POSITION INFORMATION

DETECTED AT 04 AUG 20 101501 UTC BY MEOSAR

ALERT LAST DETECTED AT 04 AUG 20 101501 UTC

GNSS - 01 54.40 N 045 37.53 E

UPDATE TIME WITHIN 2 - 60 SECONDS OF DETECTION TIME

ALTITUDE OF GNSS LOCATION BETWEEN 1600 AND 2200 METRES (BETWEEN 5200 AND 7200 FEET)

DOA - 02 00.1 N 046 06.2 E

5. OTHER INFORMATION

GNSS POSITION UNCERTAINTY PLUS-MINUS 2 SECONDS OF LATITUDE AND LONGITUDE

DETECTION FREQUENCY 406.0400 MHZ

POSITION CONFLICT BASED ON DISTANCE SEPARATION OF AT LEAST 20 KM

ELT(DT) POSITION DOES NOT REFERENCE ANY PREVIOUS POSITION

6. REMARKS

THIS DISTRESS TRACKING MESSAGE IS BEING SENT TO APPROPRIATE SAR AUTHORITIES

PROCESS THIS ALERT ACCORDING TO RELEVANT REQUIREMENTS

END OF MESSAGE

- **Sample ELT(DT) SIT message**

SGB ELT(DT)

1. **DISTRESS TRACKING** COSPAS-SARSAT DOA POSITION MATCH ALERT

2. MSG NO 00192 AUMCC REF B27400F81FD4710

3. BEACON MESSAGE INFORMATION

BEACON TYPE SGB - **ELT DISTRESS TRACKING**

AIRCRAFT 24 BIT ADDRESS 7100CE ASSIGNED TO SAUDI

TAC 62 SERIAL NO 509

HEX ID B27400F81FD4 7100CE00000

COUNTRY OF BEACON REGISTRATION 403/SAUDI

ACTIVATION TYPE AUTOMATIC BY BEACON (G-SWITCH/PROBABLE CRASH)

4. ALERT POSITION INFORMATION

DETECTED AT 03 MAY 19 085310 UTC BY MEOSAR

ALERT LAST DETECTED AT 03 MAY 19 085310 UTC

GNSS - 02 24.40 N 046 04.11 E

TIME OF GNSS POSITION UPDATE: 03 MAY 19 085308 UTC

TIME SINCE GNSS LOCATION GENERATED: 0 MINUTES

ALTITUDE OF GNSS LOCATION: 125 METRES (410 FEET)

DOA - 02 25.1 N 046 06.2 E

5. OTHER INFORMATION

BEACON CHARACTERISTICS PER TAC DATABASE PROVIDED IN A SEPARATE MESSAGE

GNSS POSITION UNCERTAINTY PLUS-MINUS 1.7 METRES

ELAPSED TIME SINCE ACTIVATION: 0 HOURS

REMAINING BATTERY CAPACITY BETWEEN 75 AND 100 PERCENT

DETECTION FREQUENCY 406.0500 MHZ

ELT(DT) POSITION DOES NOT REFERENCE ANY PREVIOUS POSITION

6. REMARKS

THIS DISTRESS TRACKING MESSAGE IS BEING SENT TO APPROPRIATE SAR AUTHORITIES.

PROCESS THIS ALERT ACCORDING TO RELEVANT REQUIREMENTS.

END OF MESSAGE

Annex

Rationale for ADT early alerting to RCCs: Triggered Transmission of Flight Data Report, March 2011

- For all accidents studied, after triggering criteria* are met:
  - 50% of aircraft impact the ground within 30 seconds,
  - 85% of aircraft impact the ground within 3 minutes, and
  - 95% within 6 minutes

- Draft letter to SPOCs to provide guidance on actions to take after receipt of an ELT(DT) alert will be discussed at JC-36

* based on ED-237, i.e., a/c very likely to be in distress