

GRICAS, a demonstrator of In-Flight «Triggerable» SAR Beacons

GRICAS, an European Commission Horizon 2020 project, aims at demonstrating innovative SAR beacon in-flight activation concept based on:

- Automatic activation of the beacon by avionics
- Automatic activation when loss of connectivity with the aircraft
- Remote activation of the beacon through the Galileo Return Link Service on request of ground segment
- Detection of anomaly at GNSS receiver level (abnormal interference level, spoofing attempt, etc...)

The scenarios will be deployed during several in-flight testing sessions, with aircraft from general aviation to ATR and Alrbus, involving real ELT (Distress Tracking), beacons (ELTA), MEOLUT (TAS) and Galileo Return-Link functions (CNES/FMCC).

ELTA SGB ELT



ST Micro TESEO III Chipset



PILDO ODP



Contacts

For GSA: **Carmen AGUILERA**

Aviation Market Development Officer and H2020 coordinator
Headquarters

Janovského 438/2 - 170 000 Prague 7 - Holešovice

Tel: +420 234 766 607 - Mob: +420 602 619 631

E-Mail: carmen.aguilera@gsa.europa.eu

For industry: **Philippe LARHANTEC**

Business Line Observation Exploration and Navigation
MEOLUT Next Product Manager

26, Av. J.F. Champollion - 31037 Toulouse Cedex 1

Tel: +33(0)5 34 35 59 62 - Mob: +33(0)6 84 25 90 26

E-Mail: philippe.larhantec@thalesaleniaspace.com

For technical matters: **Pauline MARTIN**

Business Line Observation Exploration and Navigation
GRICAS Technical Manager

26, Av. J.F. Champollion - 31037 Toulouse Cedex 1

Tel: +33(0)5 34 35 68 14

E-Mail: pauline.martin@thalesaleniaspace.com

Project supported by :

- Aeroclub of Barcelona-Sabadell
- BEA
- DGAC/DSNA
- Airbus
- Royal Air Maroc
- Wizz Air



GRICAS

IN-FLIGHT DEMONSTRATION OF

INDEPENDENT AIRCRAFT TRACKING SOLUTION IN ABNORMAL CONDITIONS

AUTONOMOUS DISTRESS TRACKING (ADT)



Being ready for future ICAO Regulation applicable in 2021.



HORIZON 2020



Context changer

Recent drama in civil aviation leading to losses of several aircraft (AF447, MH370, etc...) have shown difficulties to quickly dispatch rescue means for potential survivals and to determine the position of the aircraft's wreck, generating major search expenses to retrieve the Flight Data Recorder (FDR) and the Cockpit Voice Recorder (CVR).

This situation led to the creation of a joint RTCA/Eurocae working area through SC229/WG98 group. Its objective is to define new solutions to fill the current gap in in-flight distress tracking. It meets the ICAO recommendations raised during the Second **High-Level Safety Conference (HLSC 2015)** in Montreal, where the necessity to increase significantly the effectiveness of the current alerting and Search & Rescue services has been expressed. The conference raised a list of key improvement areas and paved the way for the development of an integrated system, the **Global Aeronautical Distress and Safety System (GADSS)**, addressing all the distress flight phases. Based on these initiatives, **an ICAO regulation will impose the capability for in-flight activations of aircraft SAR beacons for 2021.**

Following the recommendations of ICAO, EUROCAE defined 4 distress scenarios representing the minimum performance of the in-flight aircraft distress event autonomous detection and triggering criteria logic, based on analysis which included reviews of previous events:

- Unusual attitude
- Unusual speed
- Unusual altitude covering collision with ground/water
- Total loss of thrust/propulsion on all engines

The detection of these cases, the ability of the avionics and the beacon to autonomously transmit the required information to the ground after distress detection, the management of return-to-normal cases and the robustness of the whole chain to failures and threats are the keys for a real improvement of avionics rescue systems.

Solution based on future MEOSAR Service of COSPAS/SARSAT

COSPAS/SARSAT, the International Search & Rescue organization providing service for Maritime and Aviation, is going to propose, by end of 2018, a new service based on Medium Earth Orbit constellations (GPS, Galileo & Glonass). Coupled with Second Generation Beacons (SGB) available before 2020, it will provide:

- **Real time worldwide detection** and location report to rescue centres capability,
- **Instantaneous location determination** based on mono-burst triangulation,
- **Strong improvement of location accuracy**, down to 100 m compared to 5 km currently
- Localization ability for **high dynamic holders**, such as aircraft

Those capacities made of COSPAS/SARSAT the most relevant system to provide autonomous **in-flight triggered distress alert**, answering perfectly to the ICAO recommendations to be applicable in 2021.

