

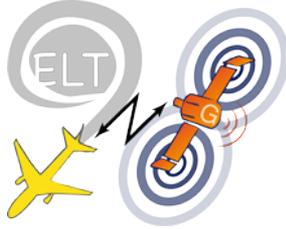
WG-98 SC-229
"Aircraft Emergency
Locator Transmitters
(ELTs)"

SC-229/ WG-98 Update

2016 Beacon Manufacturer's
Workshop

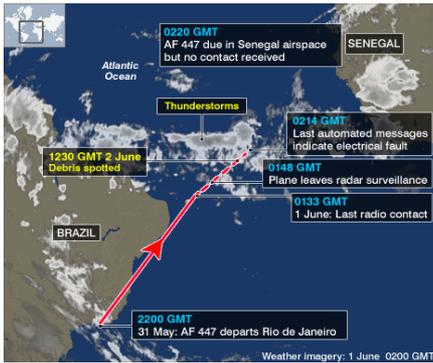
Clearwater Beach, FL, USA

May 20, 2016



Recent Missing Aircraft

AF 447 5/2009



MH370 3/2014



MH17 7/2014



QZ 8501 12/2014



4U9525 3/2015

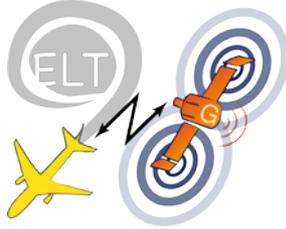


KGL9268 10/2015



MS804 5/2016





SC-229 Formation



U.S. Department
of Transportation
**Federal Aviation
Administration**

NOV 18 2013

Ms. Margaret Jenny
President
RTCA, Inc.
1150 18th St, NW, Suite 910
Washington, DC 20036

Dear Ms. Jenny:

Emergency Locator Transmitters (ELTs) are a critical tool for search and rescue first responders and are credited with saving numerous lives over the past four decades. RTCA's DO-204A, "Minimum Operational Performance Standards for 406 MHz Emergency Locator Transmitters" is the current ELT standard. However, developments in emergency locator technology, as well as lessons learned with recent aviation accidents, provide an opportunity to update the existing standards.

The Federal Aviation Administration requests RTCA form a committee to update DO-204A to align with upcoming second generation Cospas-Sarsat ELT enhancements, to address air safety investigation recommendations, to add GPS requirements for ELT equipment, and to address installation issues with flexible mounting designs. Details for each of these initiatives are attached in a proposed terms of reference. This special committee should harmonize with planned complimentary European Organization for Civil Aviation Equipment efforts. I request your prompt consideration of this request and look forward to your favorable response. Thank you for your consideration in this matter.

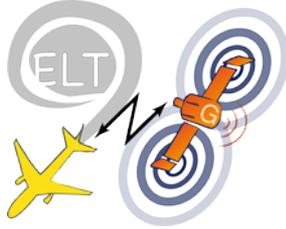
Sincerely,


Margaret Gilligan
Associate Administrator for Aviation Safety

Enclosure

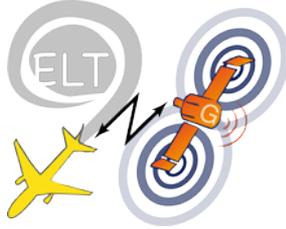
800 Independence Ave., SW
Washington, DC 20531

- ✓ **SCOPE and COORDINATION:**
 - The committee should update DO-204A Standard to address the latest design, performance, installation and operational issues for 406 MHz emergency beacons.
 - These standards should be useful to users, designers, manufacturers, and installers concerning the design and approval of these emergency beacons and their installations on aircraft and will help ensure a more standardized approach in these systems and installations approval.
- ✓ **ENVISIONED USE OF DELIVERABLE(S)**
 - The updated MOPS will become the foundation for a new revision to TSO-C126x.



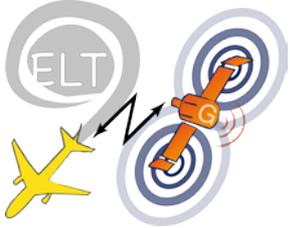
WG-98 / SC-229 Meetings

- ✓ **WG-98 Meeting 1: Paris** **27 & 28 November 2013**
- ✓ **Joint meeting 1: Washington** **10 to 12 March 2014**
- ✓ **Joint meeting 2: Toulouse** **3 to 5 September 2014**
- ✓ **Joint meeting 3: Washington** **13 to 15 January 2015**
- ✓ **Joint meeting 4: Hamburg** **21 to 23 April 2015**
- ✓ **Joint meeting 5: Washington** **1 to 3 September 2015**
- ✓ **Joint meeting 6: Paris** **15 to 17 December 2015**
- ✓ **Joint meeting 7: US** **16 to 18 March 2016**
- ✓ **Joint meeting 8: Lorient** **6 to 8 September 2016**
- ✓ **Joint meeting 9: US** **13 to 15 December 2016**



Plenary #7

- ✓ The 7th Plenary Session of the SC-229/WG-98 on 406MHz ELTs was held at RTCA HQ Washington, DC March 16-18, 2016
 - Plenary Meeting was chaired by Tom Pack , ACR Electronics, Inc
 - The Working Groups are:
 - WG-1 : Triggered Flight was chaired by Philippe Plantin de Hugues, BEA, Chris Parfitt FAA
 - WG-2 : Crash Survivability chaired by Chad Stimson of NASA
 - WG-3 : 2nd Gen Homing reported on by Ed Thiedeman, USCG
 - WG-4 GNSS, RLS, power, etc to be chaired by Chris Hoffman, ACR
 - WG-5: DO-204 Standard Development reported on by Tom Pack, ACR



WG-1 Triggered Flight

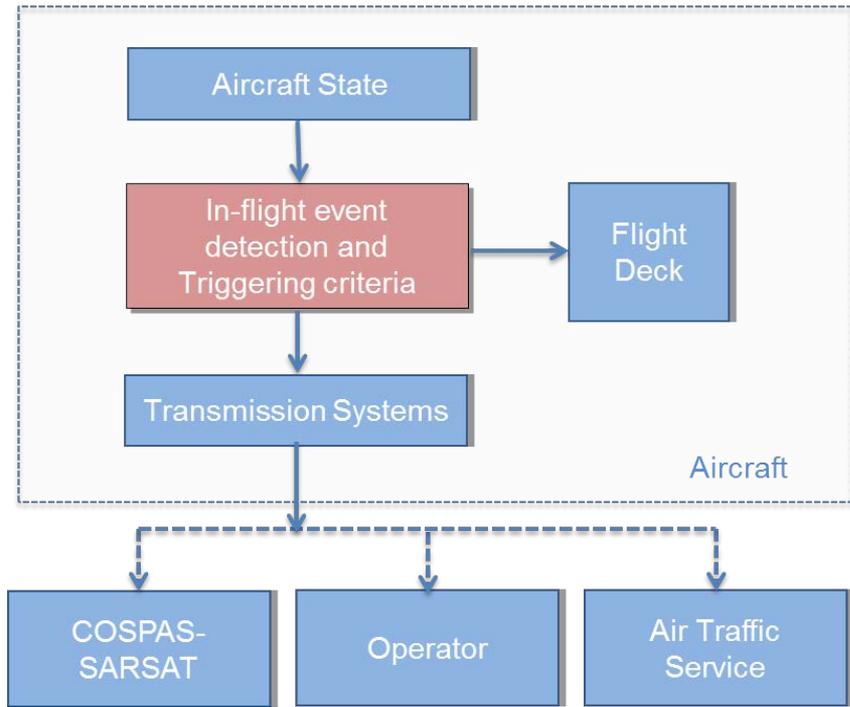
MASPS - Minimum Aviation System Performance Specification

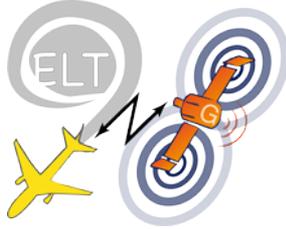
✓ Criteria

- Unusual Altitude
- Unusual Speed: low, high, vert.
- Excessive Accelerations
- Control Command Inputs
- Ground Proximity
- Excessive Pitch , Roll
- Stall

✓ Guidance

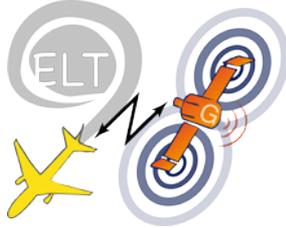
- Basic Limits
- Persistence Time
- Cancellation
- Test Procedures





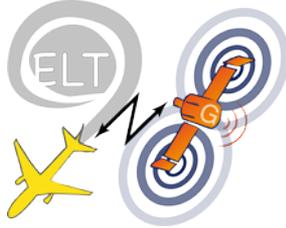
WG-1 Triggered Flight

- ✓ **New EUROCAE publications March 11, 2016:** *We are pleased to announce the publication of the following EUROCAE documents:*
- ✓ **ED-237 "MASPS for In-Flight Event Detection and Triggering Criteria"**
 - This document defines the minimum specification to be met for all aircraft required to carry a system which can be used to detect an in-flight event and to trigger the transmission of sufficient information for the purpose of locating an accident site. It specifies characteristics that should be useful as guidance material to regulatory authorities, designers, installers, manufacturers, service providers and users of systems intended for operation.



WG-2 Crash Safety

- ✓ The Working Group 2 has made good progress in studying crash safety data, proposing experiments, collect data on simulated crashes,
- ✓ Conducted three crash experiments with Cessna 172 airframes at NASA Langley.
- ✓ This data is being analyzed and will form the basis for requirements and specifications.
- ✓ This work should finish up by September 2016 and will be incorporated into the standard. The chair of WG2 has already proposed text to be inserted on the DO-204A/ED62A.
- ✓ Considering Additional Fire Requirements
- ✓ Taking on the Installation Requirements



WG-2 Crash Safety



Test article 1



Test article 2



Test article 3

NASA/TM-2015-218987

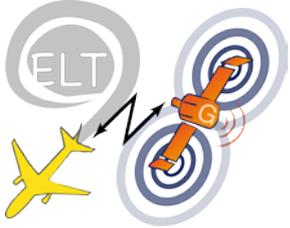


Crash Tests of Three Cessna 172 Aircraft
at NASA Langley Research Center's
Landing and Impact Research Facility

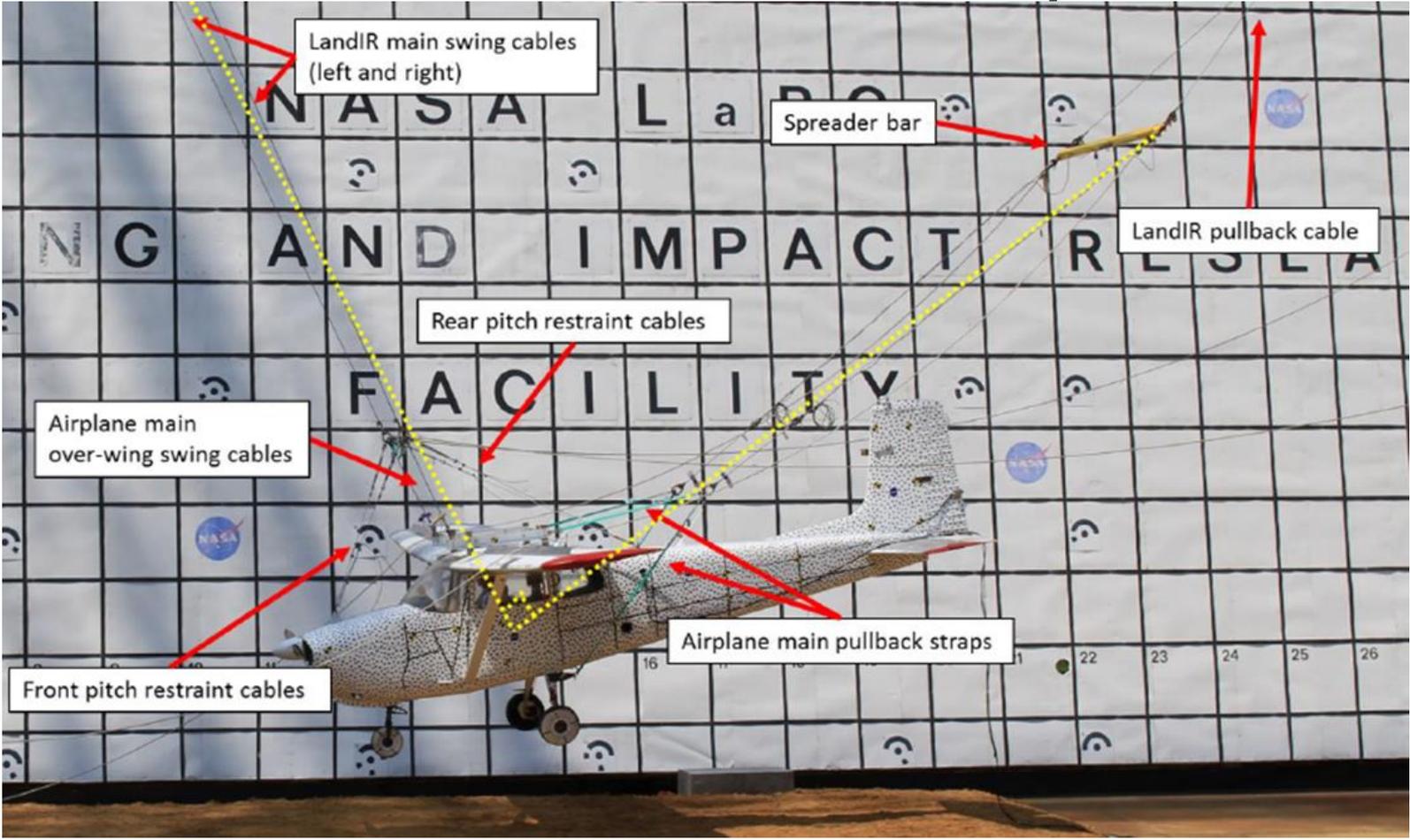
<http://www.nasa.gov/langley/retired-aviator-on-hand-to-witness-drop-test-of-his-old-airplane>

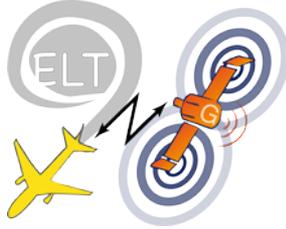
<http://www.nasa.gov/langley/second-crash-test-harvests-valuable-data-to-improve-emergency-response>

<http://www.nasa.gov/langley/crash-test-assesses-plane-emergency-locator-transmitters>

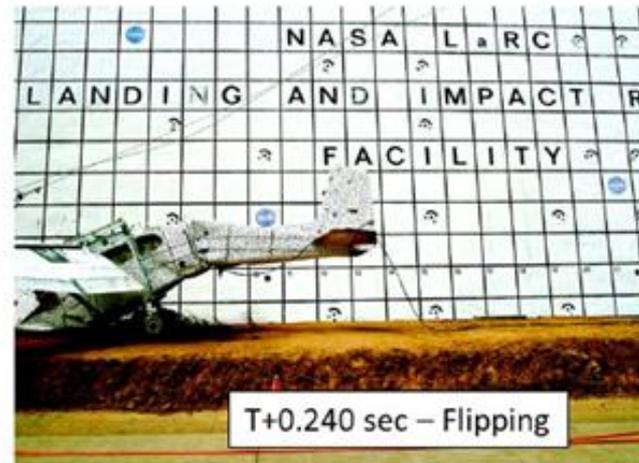
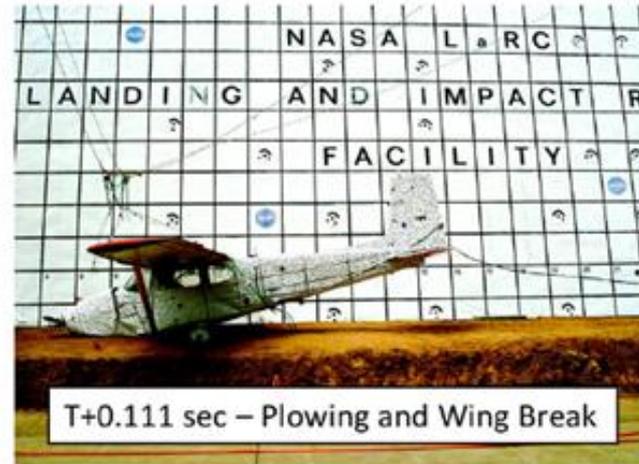
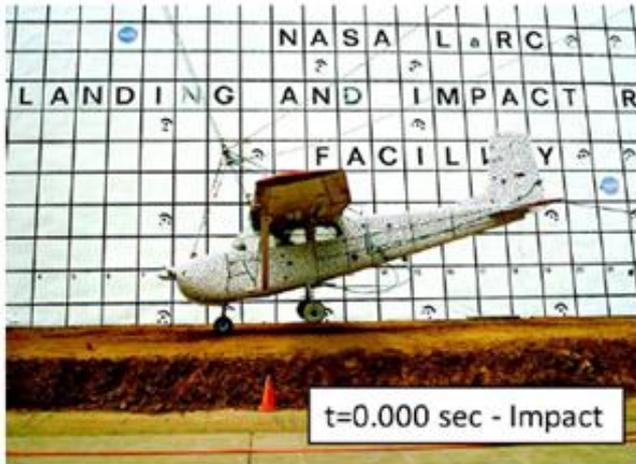


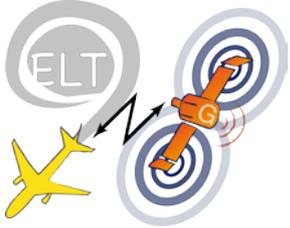
WG-2 Crash Safety



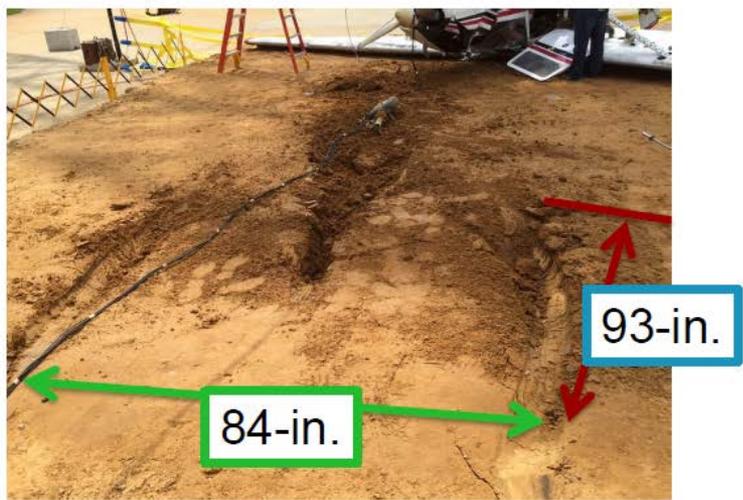


WG-2 Crash Safety

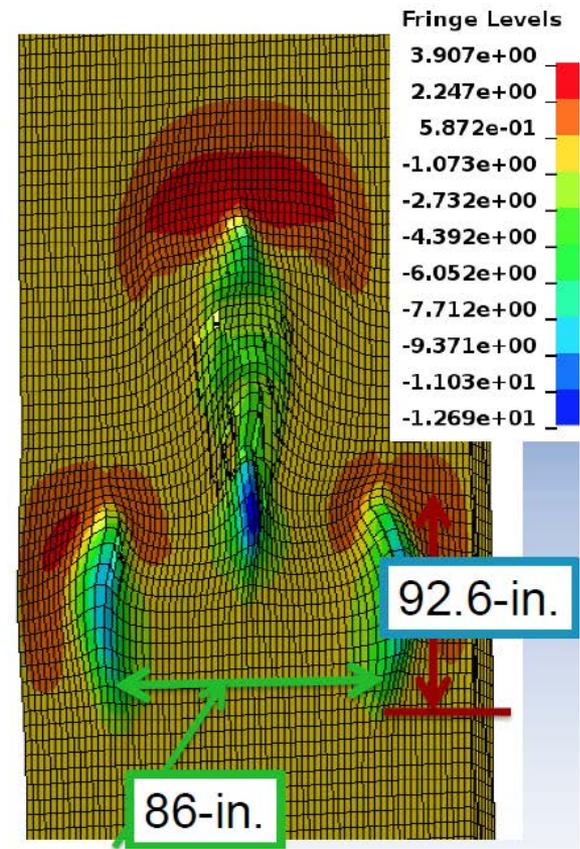
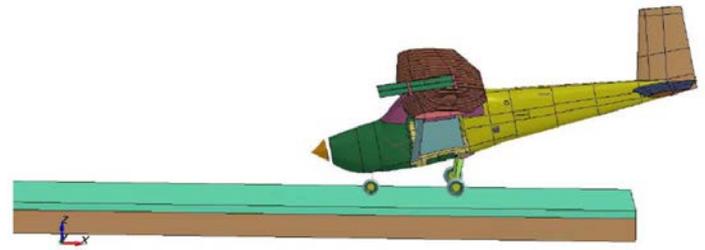


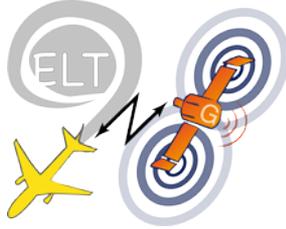


WG-2 Crash Safety



LS-DYNA Soil Only Model
Time = 0





WG-x

✓ **WG-3: SGB Homing**

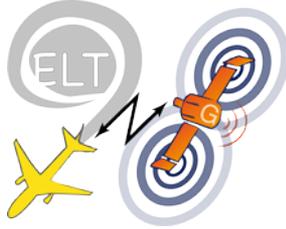
- Homing Trials
- Intelligent Transmit Scheduling
- TG-1/2016 Update

✓ **WG-4: GNSS, Power, RLS, etc**

- SC-159 GPS Presentation, Dr. Hegarty
- SC-235 DO-235 Lithium Updates

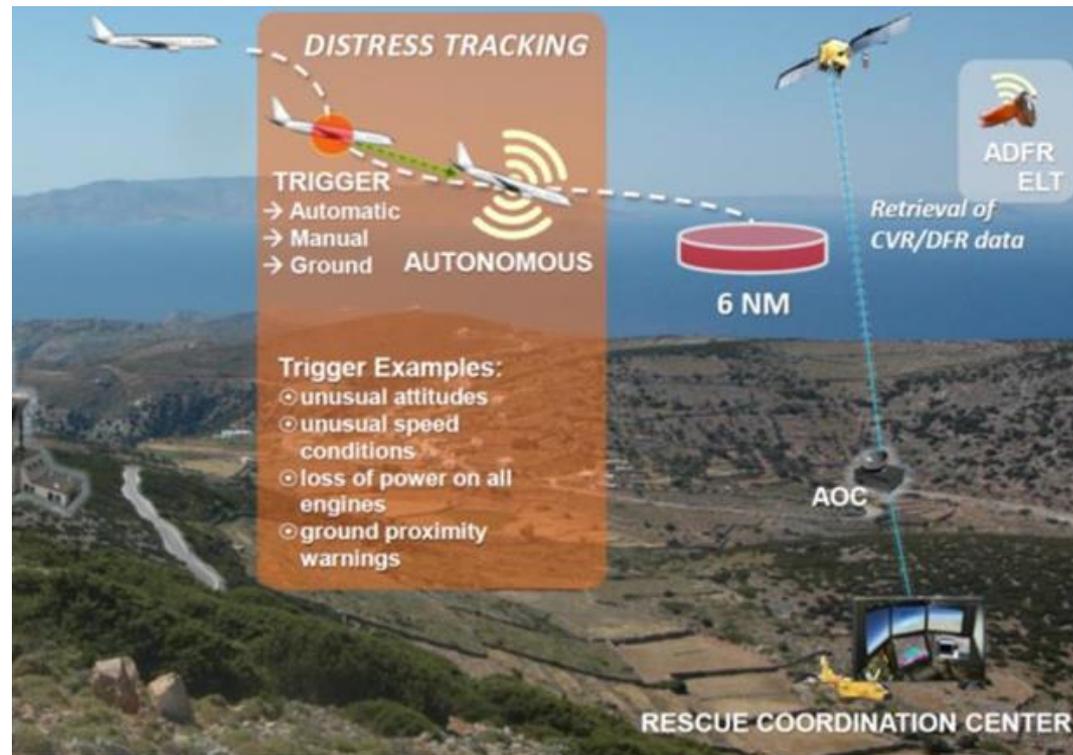
✓ **WG-5 Standards**

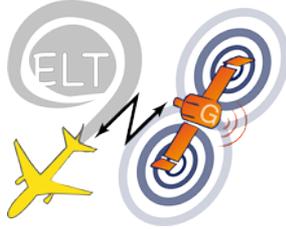
- Plenary work on combining DO-204a and ED-62a
- WG Telecons held bi-weekly converging on one document
- Next Steps to separate requirements from testing
- Add new requirements in



Impact of Dependent Organizations

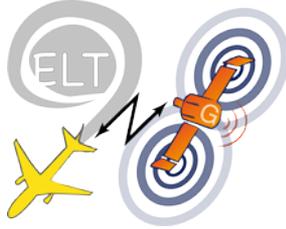
- ✓ ICAO Annex 6 SARPs on Autonomous Distress Tracking (ADT) bring in question the role of the ELT .





Impact of Dependent Organizations

- ✓ **The Cospas-Sarsat Program is behind schedule**
 - MEOSAR deployment
 - MEOLUT deployment
 - Second Generation Beacon (SGB) specifications
- ✓ **Cospas-Sarsat tasked a CWG on Triggered Flight (Oct 2015)**
- ✓ **Cospas-Sarsat is considering the inclusion of a new type of ELT to meet the ICAO ADT requirements,**
 - 1st Generation Beacon – Encoded location, TX schedule
 - 2nd Generation Beacon – Encoded location

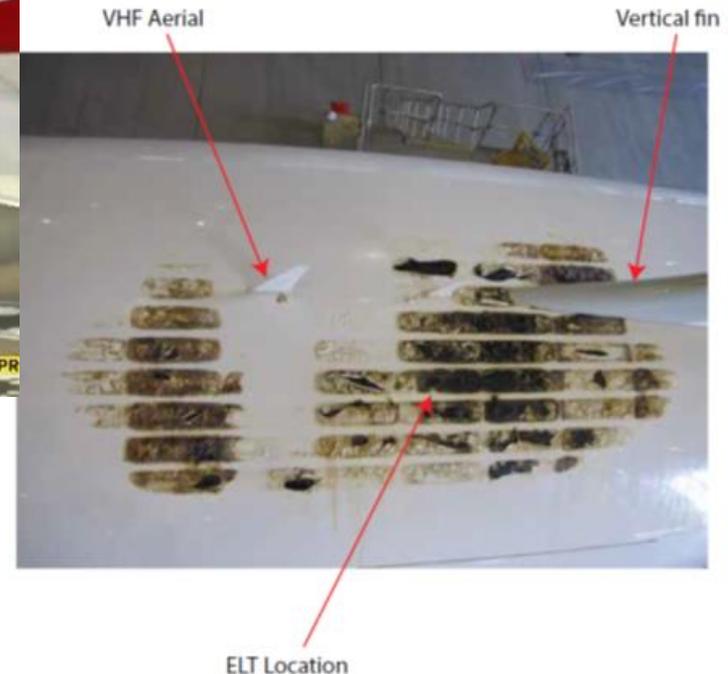


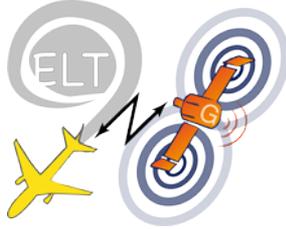
Impact of Dependent Organizations

- ✓ FAA Special Conditions on lithium batteries and the inclusion of the new DO-227 document which will be published by SC-235 .



July 12, 2013





SC-229 Schedule

- ✓ The decision was made by the committee chairs to decouple the work with Cospas-Sarsat and to concentrate finishing the merging of the standards with the inputs we have to date.
- ✓ This might mean that Cospas-Sarsat Second Generations Beacons specifications are not referenced in the next publication of the DO-204B and ED-62B.
- ✓ This does NOT mean that the C/S and ICAO activities on will be ignored. These activities are highly relevant to the US position on
- ✓ The committee leadership will keep the PMC up to date with the progress in these areas. If appropriate, the ToR will be revised.
- ✓ The Current Work Plan is to complete the following:
 - Finish Working Group Activities (Crash, Homing, GNSS, Power)
 - Merging of documents and reconciling differences
 - The addition of new requirements
 - The reorganization of the structure to better segregate requirements from verification means.
 - Draft reviews at Plenary
 - Submission to FRAC and resolution of comments to prepare final draft.
- ✓ It is estimated that this work will take 9-12 months to complete and enter into FRAC. This would put the planned FRAC submission in the Summer of 2017 and publication towards end 2017.



SC-229 Contact Information

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