



RTCA Paper No 126-17/SC229-022

EUR 149-17 / WG98-23

Paris and Washington May 29, 2017

EUROCAE WG-98 Plenary # 11 / RTCA SC-229 Plenary # 10- Meeting Minutes
“Aircraft Emergency Locator Transmitters (ELTs)”

Date	<i>Tuesday 14th through Friday 17th March 2017</i>
Place	<i>Cologne, Germany</i>
Venue	<i>E.A.S.A. Headquarters</i>
Hosted	<i>E.A.S.A. - Konrad-Adenauer-Ufer 3, D-50668 Cologne, Germany</i>

Present:

Name	1stname	Company
Plantin de Hugues	Philippe	BEA
Von Groote	Anna	EUROCAE
Morrison	Rebecca	RTCA
Pack	Tom	ACR Electronics
Taylor	Stuart	HR Smith
Stimson	Chad	NASA
DUTRUC	Hervé	Airbus Helicopters
Churchill	James	Flight Data Systems
Rouquet	Olivier	DGAC/SAR Department
Hoffman	Christopher	ACR Electronics, Inc.
Green	Charisse	Federal Aviation Administration
Fisher	John	FAA
Barry	John	FAA
Ortenzio	Aaron	US Coast Guard
Thiedeman	Edwin	US Coast Guard
Horiot	Christophe	Airbus
Bouhet	Alain	Orolia-McMurdo
Politis	Elias	NRC
Anderson	Richard	Boeing
Khalil	Fadl	Boeing
Smith	Richard	NTSB

Mazzuca	Lisa	NASA
Theodorakos	George	NASA
Lelaie	Claude	Airbus
Fuhrmann	David	USAF
Senol	Ahmet	Airbus
Audouze	Xavier	EASA

Present using WebEx:

Lemon	Dan	NOAA
Klee	Lloyd	NZ Aviation Safety

Apologies:

Chadli	Mohammed	BEA
Hiner	Eric	DME Corporation
Curran	Dave	Team Airborne Data Services

Day 1 – Wednesday 16th March (9:00 AM – 5 PM)

1. Welcome/Introductions/Administrative Remarks

Tom welcomed everyone to Cologne for the RTCA SC-229 and EUROCAE WG-98 meetings. He introduced Charisse Green (DFO) to officially open the meeting.

Charisse announced that in accordance with the Federal Advisory Committee Act, the Advisory Committee meeting is open to the public. Notice of the meeting was published in the Federal Register on: January 13, 2017 and that attendance is open to the interested public.

Rebecca gave a statement RTCA policy regarding proprietary references and new membership policy.

Anna discussed the Eurocae IPR policy and Eurocae membership policy.

Questions - No questions.

Tom asked for round table introductions.

Xavier discussed logistics for the week.

Everyone was asked to sign the attendance list.

2. Agenda overview and approval

Tom reviewed the agenda from the onscreen presentation discussing that the goal for the week was to accept all comments from the working document and reviewed the list below:

Agenda Day 1 (9 AM – 5 PM)

Briefing of ICAO GADSS-AG, COSPAS-SARSAT,...

ICAO GADSS-AG and Doc10054 activities: Philippe Plantin de Hugues
 ARINC/AEEC meeting in Coral Gable: Tom Pack & Philippe Plantin de Hugues
 Cospas-Sarsat Update: Dany St Pierre
 Cospas-Sarsat T-ELT Correspondence Working Group: Chris Hoffman

Other presentations

EASA approval process: Xavier Audouze
Certification memo on ELT: Begoña Martin Velayos
EU rules on aircraft tracking and location of aircraft in distress: Guillaume Aigoin
Discussion and work on GNSS: Chris Hoffman
FAA's position on GNSS requirements: Charisse Green & Chip Bulger
Work done by NASA regarding ELT performance and WG-2 MOPS
recommendations: Lisa Mazzuca, George Theodorakos and Chad Stimson

Working group of the whole meeting (rest of the day)

Agenda Day 2 & 3 & 4 AM

Working group of the whole meeting

Accept comments on Chapter 2 to 7
Analyze first the proposal of "ELT Equipment vs ELT Unit"

Agenda Day 4 (1 PM – 4 PM)

Other Industry coordination and presentations

FRAC information

Rest of the day

WG Status Reports
Action item review
Future meeting plans and dates
Industry coordination and presentations (if any)
Other Business

3. Minutes Washington meeting review and approval

Stuart gave an update of the minutes produced from the from Fort Lauderdale meeting.

There were no questions regarding the minutes and they were considered to be accepted.

4. Review Action Items from DC

Tom reviewed the action items and updated their status (updated below).

ACTION NUMBER	ACTIONNEE	ACTION	STATUS
ACTION 1	PHILIPPE	TO POST THE LATEST VERSION OF ED-62REVB WORKING FOR REVIEW	Action one sent by email (closed)
ACTION 2	GROUP MEMBERS	TO MAKE COMMENTS ON THE ABOVE PAPER	open (ongoing)
ACTION 3	GROUP MEMBERS	TO REVIEW THE WORK OF WG2 FROM THE WEB SPACE	open (ongoing)

ACTION 4	CLAUDE LELAIE	CHECK CS/FAR DOCUMENTS 23, 25 27 AND 29 CHECKING PARAGRAPH NUMBERS REGARDING TEXT CHANGE TO SECTION 2.4 (OPERATION OF CONTROLS)	Complete
ACTION 5	RICHARD ANDERSON	ACTION TO COMPLETE THE PARAGRAPH 6.1.11.6	Complete
ACTION 6	STUART TAYLOR	STUART TO PROVIDE FEEDBACK ON 4.4.1.1 'ADD ALTERNATIVE G LEVELS APPROPRIATE FOR ROTOR CRAFT TO BE ALLOWED 6.14G (REF CAA SPEC 16)' CONF MARCH 17 WG5 PROPOSING TO WAIT FOR WG2 INPUTS AND ASK STUART TO PRECISE THE COMMENT	Complete
ACTION 7	MARK	CONFIRM THAT AN AD AND AD (FDR) HAVE BUOYANCY REQUIREMENTS AND DO THEY MATCH THE CURRENT DEFINITIONS.	OPEN should be part of the review on this issue by Stuart and Blake
ACTION 8	ED	CLEARLY DEFINE GNSS: INTERNAL, INTEGRAL, EXTERNAL. CLARIFY DEFINITION OF EXTERNAL GNSS WITH RESPECT TO DT; WITH RESPECT TO EXTERNAL IS IT AIRCRAFT INPUT ONLY OR POSSIBLE CELL PHONE?	Complete
ACTION 9	WG4	QUESTION OF GNSS PERFORMANCE FOR ELT: C/S, RTCM,? AF, AP, AD, S ARE STATIC SCENARIOS, DT MORE DYNAMIC.	OPEN Small WGs created with list of participants and leader
ACTION 10	PPH and Dany with support from Nicolas Hinchcliff	CLARIFY ICAO REQUIREMENT FOR AUTONOMOUS OPERATION AND HOW IT APPLIES TO EXTERNAL GNSS AS LONG AS IT IS AVAILABLE.	OPEN
ACTION 11	TOM PACK	ELT POWER SOURCE, FOR INTEGRAL DT SYSTEM?	Complete
ACTION 12	XAVIER, TOM	FOR EACH CAPABILITY IN CHART, THERE NEEDS TO BE REQUIREMENTS.	OPEN
ACTION 13	STUART BLAKE	CONFIRM ELT AD ACTIVATION AND DEPLOYMENT REQUIREMENTS WITH MFGS: HR SMITH, DRS	OPEN
ACTION 14	REBECCA MORRISON	DEFINE MANDATORY, PROHIBITED, OPTIONAL , N/A	Complete
ACTION 15	PLENARY ISSUE: WG1	PLENARY QUESTION: WHAT HAPPENS WHEN AIRCRAFT POWER AND/OR ELT COMMUNICATION IS LOST? The group agreed that the ELT system shall be fail safe	OPEN small group created
ACTION 16	PLENARY	HOW DOES THE ELT KNOW WHEN IT IS DT ARMED.	OPEN small group created
ACTION 17	PPH with support from Nicolas Hinchcliff	CLARIFY ICAO REQUIREMENT FOR ELT ADFDR DEPLOYMENT VS. ACTIVATION	OPEN
ACTION 18	Xavier and a small group	Use of the ELT definitions (replace equipment)	OPEN
ACTION 19	PPH	Send the white paper sent to ARINC	OPEN

Tom and Philippe discussed the key milestones. George asked if the document could be cleaned up as it is very difficult to work through. It was agreed that once the content is agreed a review of the paragraphs could be done.

The current plan was discussed:

- March 2017: joint plenary meeting
- June 2017: joint plenary meeting
- September 2017: joint plenary meeting – Document released for FRAC/Open Consultation
- Early October 2017: Document distributed for FRAC / Open Consultation – 45 days
- December 2017: joint plenary meeting, review of comments received, FRAC resolution and consensus on the Final documents
- PMC and Council on March 2018: Final document submitted for approval
- Early April 2018: Publication of the document by RTCA/EUROCAE of ED-62B and DO-204B

Tom announced that he had just been part of the lithium battery FRAC process and suggested that it will take time and there will be a lot of discussion.

Philippe reviewed the dates that were agreed from the last meeting.

Dany asked if the Washington meeting would be extended to 4 days. Tom said we could review during the week but should assume it will be 4 days as there is still a lot of work to cover.

5. ICAO UPDATE

Philippe gave a presentation regarding the GADSS advisory group.

He discussed the group activities where they split the concept of operation in to 3 sections from the original 4 sections into aircraft tracking, autonomous distress tracking and post flight localisation and recovery. He announced that the document will be released shortly.

He discussed the definitions of each of the three types of tracking and discussed ongoing activities.

6. ICAO Doc 10054

Philippe gave a presentation regarding the manual on 'Location of Aircraft in Distress and flight recorder data recovery' discussing the Doc10054. He announced that this is the guidance material which was called up in Amendment 40A of Annex 6 which became applicable last November. He announced that the first drafting would be known as the location of aircraft in distress and the second drafting would be the flight recorder data recovery.

He reviewed the content of the document discussing that the main objective of the manual is to provide guidance for the implementation of the related provisions and that it isn't the intention to amend or change Annex 6.

Philippe announced that the work will be progressed under his leadership with ICAO and he plans to arrange a teleconference in the week of 20 March 2017 and that the work has already been started.

The aim is to have a finalized draft manual completed for review at the FLIRECSWG/10 meeting in October 2017

7. ARINC/AEEC Update

Philippe provided an update from their feedback from the SAI subcommittee meeting in February 2017 in which Tom attended and Philippe joined via Webex.

They gave a presentation on GADSS-AG and the work we are doing. Tom also gave a background into Cospas Sarsat and how the white paper for ARINC 429 label was detailed.

They reported back that a draft ARINC Project Initiation/Modification (APIM) has been submitted on Autonomous Distress Tracking (ADT) and as ELT-DT will be one type of ADT it was suggested that the content of the Label ARINC 429 as detailed in our white paper be “consistent” or “identical” to the one that will be define for the ADT.

Philippe described how the process works during the 3 main phases from the start of the requirement to publication of the ARINC report which will take approximately 6 months.

8. Cospas-Sarsat Update: Dany St Pierre

Dany presented an update from Cospas Sarsat. As there were no meetings since our December he focussed on what they plan to achieve in 2017. He provided an update on MEOSAR space and ground segments, Task group meetings, and second generation beacons (specifications and type approval standards) including their expectations for early 2018.

9. Cospas-Sarsat T-ELT Correspondence Working Group: Chris Hoffman

Chris Hoffman discussed the work on the T-ELT correspondence talked about the group formed from two groups within Cospas Sarsat. They now have a set of minor amendments to T.001 for distress tracking which has been submitted to the task group meeting and a series of changes proposed to T.007 for the type approval process of 1st generation ELT's. He said that some of the changes are straight forward but some could generate discussion like the testing of the GNSS receiver. The group are also looking at the ground segments and what needs to change to be able to process T-ELT's. For second generation T-ELTs. Chris also discussed that they are updating T.021 to integrate T-ELTs but more work is needed in this area and it will just be integrated into the 2nd generation Cospas Sarsat specifications as they develop..

10. EASA approval process: Xavier Audouze

Xavier gave a presentation on EASA describing the Institutions, Facts and Figures, and their systematic approach. He described their interaction with national authorities and the EU regularity process and how rules are implemented.

He described the ETSO Process and the bilateral agreement with the US to approve a TSO. He reviewed the process from ETSO through to Installation approvals and how to show compliance using guidance materials.

He gave a number of links to the website which can be found on the presentation listed on the webpage.

11. Certification memo on ELT: Begoña Martin Velayos

Begoña discussed how the guidance material works in EASA, describing the background to how EU 965/2012 air operations evolved.

She discussed the use of ED62 and that it covers guidance for the transmitter unit and crash sensor and for the installation of the antenna.

For deployable ELTs they use CAP 1144 produced by the UK CAA.

She discussed the next steps to introduce new recommendations using the Nasa report and updates of ED62B and AAIB reports and for Adelts, they plan to use CAP 1144 – Adelt review report by the UKCAA.

12. EU rules on aircraft tracking and location of aircraft in distress: Guillaume Aigoin

Guillaume Aigoin gave a presentation describing the EU rules on Location of an aircraft in distress starting with a background resulting from AF447 in June 2009 and MH370 in March 2014.

He reviewed the regulation (EU) 2015/2338 for 'flight recorders, underwater Locating devices and aircraft tracking systems' and rule making that has evolved as a flow down from ICAO.

He described the difficulties involved and how they are meeting the ICAO timeline in the publication of AMC/GM documents with the aim of CAT.GEN.MPA.210 entering force in January 2021.

13. Discussion and work on GNSS: Chris Hoffman

Chris gave a presentation from WG-4 looking into GNSS Receivers in ELTs. They looked at TSO-C199 which led to a sequence of questions that have since been answered between meetings.

He summarised by saying that the consensus is that both GNSS Receivers and Antennas used in ELTs should be specified and tested to some extent, Different requirements may well apply to different types of ELTs, specifically the requirements for ELT(DT)s are probably different to those of other types of ELT, We should permit the use of GNSS Receivers operating on any constellation or combinations thereof, We should not require SBAS corrections and we should co-ordinate our work with Cospas-Sarsat to make sure that we do not duplicate effort and testing requirements.

He reviewed how Cospas Sarsat do their testing and has derived the following questions to move forward:-

- Is the testing proposed by Cospas-Sarsat sufficient for all ELTs?
- If not do we want to add additional test requirements to DO-204 / ED-62 or request C/S to strengthen their tests?
- Do we want to include additional / separate tests for Integral or Internal ELT GNSS Antennas in DO-204 / ED-62?
- Are there any other GNSS requirements and / or tests that we need to consider?
- What is the plan to address the above points by the next meeting in June?

14. FAA's position on GNSS requirements: Charisse Green

Charisse gave a presentation explaining the FAA position on requirements for ELTs, discussing the purpose of sc-229 and that it does not need to supplement c/s T.018 encoded position requirements. She reviewed the c/s requirements set out in c/s T.018 looking at time, accuracy and error checking and additional DT requirements. She discussed how beacon requirements are set and how Cospas Sarsat set the basic emergency requirements and RTCA/Eurocae address crash airworthiness, crash activation, environmental, and other aviation specific requirements

Charisse made a recommendation that SC-229 adopt C/S T.018 for encoded position requirements and C/S T.021 for encoded position tests.

However she also recommended that ELT manufacturers educate themselves on the best COTS GPS solutions and consider broadband interference, ramp error detection detection/exclusion, consider pseudorange step detection/exclusion, use SBAS Health (Exclude unhealthy/UDREI=15) and use SBAS fast and long term corrections when available.

Day 2 (All Day), 3 (All Day) & 4 (AM) – Wednesday 15th, Thursday 16th & Friday 17th

The Working group worked through Accept comments on Chapter 2 to 7 and analyzed the first the proposal of "ELT Equipment vs ELT Unit"

Day 4 (2 PM) –Friday 17th

Tom welcomed everyone back to the plenary session.

15. EASA Presentation

Xavier gave a presentation discussing EASAs approach to adopt the ICAO requirement describing the issues involved.

He discussed the current carriage of ELTs and what ICAO are advising. He believes there will be an additional delay in rescuing survivors which could result in loss of life. He discussed 2 possible solutions as he believes that the resolution of 6 NM to locate the scene of an accident is okay but not accurate enough to find survivors. Full presentation can be found on the webspace.

16. Action item review

Philippe reviewed the action list as some of the outstanding actions had been closed during the week. The following items were closed :-

ACTION NUMBER	ACTIONNEE	ACTION	STATUS
ACTION 7	MARK	CONFIRM THAT AN AD AND AD (FDR) HAVE BUOYANCY REQUIREMENTS AND DO THEY MATCH THE CURRENT DEFINITIONS.	DONE
ACTION 9	WG4	QUESTION OF GNSS PERFORMANCE FOR ELT: C/S, RTCM,? AF, AP, AD, S ARE STATIC SCENARIOS, DT MORE DYNAMIC.	DONE
ACTION 13	STUART BLAKE	CONFIRM ELT AD ACTIVATION AND DEPLOYMENT REQUIREMENTS WITH MFGS: HR SMITH, DRS	DONE
ACTION 15	PLENARY ISSUE: WG1	PLENARY QUESTION: WHAT HAPPENS WHEN AIRCRAFT POWER AND/OR ELT COMMUNICATION IS LOST? The group agreed that the ELT system shall be fail safe	DONE
ACTION 18	Xavier and a small group	Use of the ELT definitions (replace equipment)	DONE
ACTION 19	PPH	Send the white paper sent to ARINC	DONE

17. Future meeting plans and dates

It was agreed that future Meetings will be extended to 4 days due to the workload that needs to be competed for FRAC.

The next meeting is at Washington DC at RTCA from the 6-9th June.

18. Industry coordination and presentations (if any)

No Presentations

19. Other Business

No other business

20. Adjourn

Tom thanked Stuart, Charisse, Philippe and group leaders for their work.

He also thanked everyone for attending.

Meeting closed 15:00

List of Actions

ACTION NUMBER	ACTIONNEE	ACTION	STATUS
ACTION 1	Philippe	To post the latest version of ED-62revb working for review	Open
ACTION 2	Group Members	To make comments on the above paper	Continuous Action
ACTION 3	Tom	To add cospassarsat schedule to timeline	Open (carried over)
ACTION 4	Philippe with support from Nicolas Hinchcliff	Clarify ICAO requirement for ELT ADFDR deployment vs. activation	Open