



EUR 23-89/WG110-32

Saint Denis, 30 March 2023

RTCA Paper No.125-23/SC237-32

EUROCAE WG-110 Meeting #17 Calling Notice/ RTCA SC-327 Meeting #15 Minutes of Meeting
“Helicopter Terrain Avoidance Warning Systems (HTAWS)”

Date	16 May – 18 May 2023 <i>Starting at 09.00 EST on the 1st day and ending at 15:00 EST on the third day</i>
Place	RTCA
Venue	<i>RTCA, Inc. (1150 18th St NW Ste 910, Washington, DC 20036); Room - Colson; Room - NBAA</i>
Hosted by	RTCA
Contact	Brandi Teel , Program Director, RTCA (202) 330-0671 or bteel@rtca.org Esther Hoyas , Technical Programme Manager, EUROCAE +33 762061895 or esther.hoyas@eurocae.net

Summary of the EUROCAE Working Group 110/ RTCA SC 237 (Meeting 17) Helicopter Terrain Awareness Warning Systems (HTAWS) for Onshore Operations.

ATTENDEES:

The following people attended all or part of the meeting, in person or by Webex:

Organisation	First name	Last name	Email address
Airbus Helicopters Deutschland GmbH	Dietmar	Kleinitz (DK)	dietmar.kleinitz@airbus.com
Bell RTCA Chair	Michael	Deer (MD)	mdeer@bellflight.com
Collins Aerospace	Philippe	Salmon (PS)	philippe.salmon@rockwellcollins.com
EASA	Raffaele	Di Caprio (RDC)	raffaele.dicaprio@easa.europa.eu
EUROCAE	Esther	Hoyas (EH)	esther.hoyas@eurocae.net
FAA	Rich	Adler (RA)	Richard.Adler@faa.gov
Garmin	Duncan	Macklin (DM)	Duncan.macklin@garmin.com
Honeywell EUROCAE Chair	Yasuo	Ishihara (YI)	yasuo.ishihara@honeywell.com
Leonardo	Luca	Savino (LS)	luca.savino@leonardocompany.com
RTCA	Brandi	Teel (BT)	bteel@rtca.org
Sikorsky	Bob	Endrizzi (BE)	robert.j.endrizzi.jr@lmco.com
Sikorsky	Steve	Schellberg	steve.schellberg@lmco.com
Sikorsky	Jarod	Kloda	jared.kloda@lmco.com
UK CAA	Dave	Howson (DH)	dave.howson@caa.co.uk

1 Welcome

Yasuo Ishihara (YI) and Mike Deer (MD) welcomed everyone to the meeting.

2 Introductions

No new participants present. Mark Prior (MP) has provided his apologies for not being able to attend. Minutes will be recorded by MD, and YI.

3 Administrative Remarks/EUROCAE and RTCA Policy

Brandi Teel (BT) and Esther Hoyas (EH) presented the mandatory slides which explain the obligations of members and covered administrative aspects of the meeting.

4 Acceptance of Previous Meeting Minutes

The Minutes from Meeting 17 were reviewed and accepted.

5 Review of Action Items

Actions arising from the previous meetings were reviewed and updated during the meeting. The final status of the actions is shown in the tables below.

Action Reference	Action	By Whom	By Date
13.6	Provide the EASA HTAWS-related accident data.	EASA (Eric Bennett)	Agreed to close during the meeting.
16.1	Calculate the alert times for each of the Mode 1 Caution and Warning Envelopes under review.	CAA (Dave Howson)	Closed
16.2	Add 95% and 99% contours to Mode 1 data, divided by type of operation.	Aircraft OEMs	Closed
16.3	Add 95% and 99% contours to Mode 3 data, divided by type of operation.	Aircraft OEMs	Closed
16.4	Provide copies of their presentations shown during discussions.	Airbus, Leonardo, Sikorsky	Closed
16.5	Sikorsky (BE) to review the Mode 7A Guidance in Appendix B and identify any changes/additions required.	Sikorsky (BE)	Closed. Appendix was reviewed during the meeting.
16.6	Provide an update on modifying the SC 227 ToRs to include baralt mis-setting protection.	FAA (RA)	Closed. See note below.
16.7	Review MOPS Section 5.3, Test Cases.	Honeywell (YI)	Closed

Regarding Action 16.6: RA confirmed the action to address the baralt mis-setting protection has been discussed with SC-227 and that they have chosen to address the issue through the AC which is open for revision. DH raised concerns and agreed to contact the SC-227 Chair to address potential MOPS changes.

Note: The following Minutes are recorded by topic and not necessarily in a chronological order.

6 Finalization of Mode 1 and Mode 3 envelopes

Review of Mode 1

DH shared data concerning the alert times based on the proposed Mode 1 envelopes. The data recommended 20 seconds before impact for a caution alert and 10 seconds before impact for a warning alert.

DH shared data showing recovery time based on a constant g manoeuvre.

Leonardo (LS) presented analysis of the Mode 1 alert rate based on 95% and 99% envelopes for the AW169, AW189 and AW139. The data showed that the proposed Mode 1 Caution envelope would not cause excessive nuisance alerts. A copy of the charts was provided.

Airbus (DK) has not revised the data that was previously shared in Cologne. The data already provided information similar to that requested for this meeting.

Sikorsky (BE and JK) shared revised data which compared the S76 to the proposed Mode 1 envelopes. Data showed entry into the Mode 1 envelope in the upper left corner. Sikorsky proposed to reduce the envelope in that area to avoid nuisance alerts.

Based on the information from participants revised Mode 1 envelopes were developed based on the following:

- The proposed envelopes follow the alert time slope (10 sec - must warn, 15 sec -may warn, 20 sec - must caution, 25 sec - may caution) based on the rate of descent to the maximum extent without infringing on the airframe performance data and approach data.
- Spaced the envelopes to provide approx. 2 secs between caution and warning.
- Performance data considered as follows:
 - May caution below the average 95% Mode 1 data.
 - Must caution below the average 99% Mode 1 data.
 - Must caution below the IFR approach lines.

After much discussion the envelopes were accepted by the group with the following added to the MOPS as Mode 1 envelope implementation criteria:

- The caution envelope should provide the maximum amount of alert time possible.

- The caution envelope should consider approved approach angles and the expected approach descent rate for the aircraft type.
- Warning envelope should allow sufficient time to complete a Mode 1 Caution aural alert based on a constant rate of descent.
- The May Alert region provides for the possibility of multiple programable envelopes to accommodate different types of operation.

Review of Mode 3A

No additional data provided for Mode 3A. It was agreed that the current Mode 3A envelope will be frozen. The issue of repositioning aircraft which could introduce nuisance alerts would be addressed through pilot procedures by inhibiting the HTAWS.

7 Review of Internal MOPS Comments

MOPS internal comments were reviewed, changes were made to the MOPS and all comments closed.

8 Closure of MOPS for public review

The Mode 7A appendix was reviewed and minor adjustments were made. Document was finalized and is ready for FRAC.

9 Discussion of possible improvements to DO-309

Areas for further discussion:

- Handling of published landing sites in the database.
- Consider including GCAS like technology.

It was recommended to consider a public meeting to gather feedback on FLTA issues from operators, potentially during HeliExpo or another forum.

Action: All to review DO-309 prior to the next meeting for potential improvements.

10 Dates and Location of future meetings

The next plenary meeting would be held at the EUROCAE offices in St-Denis on 23 - 24 August 2023, with the option of attending by Webex.

11 AOB

YI has been contacted by ACAS-X committee to coordinate alerts from ACAS-X and HTAWS.

MD will provide an update of the Onshore HTAWS work at the EASA R.COM meeting in June. Other forums should be considered for communication of the new MOPS.

FRAC completion in August would mean PMC in December and publishing 1 week later.

12 Close

The meeting closed at 11:00 on 18 May 2023.

13 Decisions and Actions

The following actions were raised during the meeting:

Action Reference	Action	By Whom	By Date
17.1	All to review DO-309 prior to the next meeting for potential improvements.	All	Next meeting

The following actions from previous meetings remain open:

No open actions.

Mike Deer and Yasuo Ishihara
Co-Chairs, SC 237/WG-110