

Proposal for amendments to ECE/TRANS/WP.29/GRSG/2016/19

The text reproduced below was prepared by the expert from OICA to introduce requirements for Automatic Emergency Call Component Approvals (AECC). The colour code for the modifications to document ECE/TRANS/WP.29/GRSG/2016/19 is indicated in the preliminary comments.

Preliminary comments

- This document introduces requirements for Automatic Emergency Call Component Approvals (AECC) that can be integrated into Automatic Emergency Call Device approvals (AECS) and/or Automatic Emergency Call Device installation approvals (Installation of AECD) under the new AECS Regulation.
- Formatwise, the AECC requirements are inserted as a new Part Ia as agreed during AECS-13
- Current Part I becomes accordingly Part Ib
- This document could be a new series 01 to the new AECS Regulation
- For best understanding of the text:
 - a. Red font: AECC requirements that are copied from AECD requirements
 - b. Red font with yellow highlight: specific AECC text or terminology

Regulation No. XXX

UNIFORM PROVISIONS CONCERNING THE APPROVAL OF

Ia EMERGENCY CALL COMPONENTS (AECC)

Ib EMERGENCY CALL DEVICES (AECD)

II VEHICLES WITH REGARD TO THE INSTALLATION OF AN AECD OF AN APPROVED TYPE

III VEHICLES WITH REGARD TO THEIR AECS

Contents

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1. Scope

1.1 This Regulation applies to:

- (a) **Part Ia:** The approval of components which are intended to be fitted as part of an Accident Emergency Call Device
- (b) **Part Ib:** the approval of Accident Emergency Call Devices which are intended to be fitted to vehicles of categories M1 and N1¹;
- (c) **Part II:** the approval of vehicles of categories M1 and N1¹ with regard to the installation of an Accident Emergency Call Device which has been approved to Part I of this regulation.
- (d) **Part III:** the approval of vehicles of categories M1 and N1¹ with regard to their Accident Emergency Call System or with regard to the installation of an Accident Emergency Call Device which has not been separately approved according to Part I of this Regulation.

1.2 It does not apply to:

- (a) Communication module functionality and communication antenna functionality, unless otherwise prescribed in this Regulation;
- (b) The data additional to MSD to be conveyed to PSAP, the format of the data, the mechanism and logic of data transmission, data exchange protocol, operation modes and conditions of transitions between such modes, performance of the test call and test data transfer, response to protocol commands received from infrastructure and network registration logic;
- (c) Privacy, data protection and personal data processing.
- (d) Periodical Technical Inspection

1.3 Vehicles

- in the scope of neither Regulation No. 94 nor Regulation No. 95 and not fitted with an automatic triggering system,

¹ As defined in Section 2 of the Consolidated Resolution on the Construction of Vehicles (R.E.3) (document TRANS/WP.29/78/Rev.2) – www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html.

- of category M1 in the scope of Regulation No.94 and not equipped with frontal airbag
- of category N1 in the scope of Regulation No.95 and not equipped with side airbag, or

shall be excluded from the scope of this regulation.

1.4 GNSS positioning may be approved at the request of the applicant.

However, if the applicant opts to request approval ~~to~~ of AECD/AECS or AECS without the GNSS positioning as described in this regulation, national requirements of the Contracting Parties apply.

1.4a Pre-crash hands-free audio performance may be approved at the request of the applicant.

However, if the applicant opts to request approval of AECS without the hands-free audio performance assessment as described in this regulation, national requirements of the Contracting Parties apply.

1.5 Vehicles of the following categories shall be excluded from the scope of this regulation:

- Armoured vehicles¹
- M1 vehicles with a total permissible mass above 3.5t

2. Definitions - general

For the purposes of this Regulation:

- 2.1 “*Communication module*” means a component of an AECD designed for voice communication and to transmit data about an accident using terrestrial mobile telephone communications networks;
- 2.2 “*Human/Machine interface (HMI)*” means a component or function of an AECD designed to allow the user to interact with the device, including by receiving visual information, obtaining visual information and introducing control commands;
- 2.3 “*Data exchange protocol*” means the set of rules and agreements that define the content, format, time parameters, sequence and error checks in messages exchanged between an AECC or AECD and the devices of Public Service Answering Party (PSAP).
- 2.4 “*Public/Private Safety Answering Point (PSAP)*” means a physical location where emergency calls are first received under the responsibility of a public authority or a private organization recognized by the national government / responsible authorities.
- 2.5 “*Airbag*” means a device which, in the event of a severe impact affecting the vehicle, automatically deploys a flexible structure intended to limit the gravity of the contacts of one or more parts of the body of an occupant of the vehicle with the interior of the passenger compartment.
- 2.6 “*Satellite-Based Augmentation System*” (SBAS) is a system ensuring the correction of local errors of GNSS systems due to interferences via a network of ground-based stations. (ex: EGNOS, WASS, QZSS).
- 2.7 “*Power supply*” means the component(s) that supply power to the AECC or AECD.
- 2.8 “*Back-up power supply*” means the component(s) that supplies(y) power to the AECC or AECD when the power supply fails.

Part Ia: APPROVAL OF COMPONENTS WHICH ARE INTENDED TO BE FITTED A PART OF ACCIDENT EMERGENCY CALL DEVICES (AECD)

3. Definitions

3.1 “AECC (*Accident Emergency Call Component*)” means one or a combination of the following components:

- Control module
- Communication module excluding microphones and loudspeakers
- Back-up power supply (if fitted)
- Power supply
- Connectors²
- Network access antenna

3.2 “*Global Navigation Satellite System receiver*” (“*GNSS receiver*”) means a component of an AECC/AECD/AECS designed to determine the vehicle positioning and time information using signals from global navigation satellite systems; the GNSS receiver can be included in the AECC or AECD or in another external control unit, as long as the AECC or AECD ensure its ability to provide the vehicle positioning information in case of an event.

3.3 “*Control module*” means a component of an AECC or AECD designed to ensure the combined functioning of all components of the AECD;

3.4 “*Mobile Network antenna*” means a component that ensures the transmission of data and bidirectional audio signals for voice communication

3.5 “*Type of AECC*” means devices that do not differ in such essential respects as:

- (a) The manufacturer's trade name or mark;
- (b) Their construction;

4. Application for approval of an AECC

4.1 The application for approval of a type of AECC shall be submitted by the holder of the trade name or mark or by his duly accredited representative.

4.2 A model of the information document is given in Annex 4.

4.3 For each type of AECC, the application shall be accompanied by samples of complete sets of AECC's representative of the type to be approved, in sufficient quantities for the tests prescribed by this regulation. Additional specimens may be called for at the request of the technical service responsible for conducting the test.

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- Only connectors related to the parts listed in this paragraph
- The length of the harness, and when applicable its fixation, can be decided by the applicant, in agreement with the Technical Service, so that it is representative for the different installation configurations of the AECC.

5. Markings of an AECC

- 5.1 The samples of AECC submitted for approval shall bear the trade name or mark of the manufacturer. This marking shall figure at least on the unit or units containing the GNSS receiver and communication module. It shall be clearly legible and be indelible.
- 5.2 The unit or units containing the GNSS receiver and communication module shall possess a space large enough to accommodate the approval mark. This space shall be shown on the drawings referred to in Annex 4.

6. Approval

- 6.1 If the samples submitted for approval meet the requirements of paragraph 7 of this Regulation, approval of the pertinent type of AECC shall be granted. Since some of the requirement of paragraph 7 are optional, the competent authority shall indicate in the communication document of Annez XX which verifications are made for the AECC .
- 6.2 An approval number shall be assigned to each type approved. The first two digits (at present 00) shall indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval. The same Contracting Party shall not assign the same number to another type of AECC.
- 6.3 Notice of approval or of refusal, or of extension or withdrawal of approval, or of production definitively discontinued of a type of AECC pursuant to this Regulation shall be communicated to the Parties to the Agreement which apply this Regulation by means of a form conforming to the model in annex 1 to this Regulation.
- 6.4 There shall be affixed, conspicuously and in the space referred to in paragraph 5.2 above, to every AECC conforming to a type approved under this Regulation, in addition to the mark prescribed in paragraph 5.1, an international approval mark conforming to the model given in annex 1, consisting of:
- 6.4.1 A circle surrounding the letter “E” followed by the distinguishing number of the country which has granted approval;
- 6.4.2 The number of this Regulation, followed by the letter “R”, a dash and the approval number to the right of the circle prescribed in paragraph 6.4.1.
- 6.5 The approval mark shall be clearly legible and be indelible.

7. General requirements

- 7.1** If the applicant for approval so requests, the data sending and voice connection provisions in this par. may be part of the approval of a type of AECC. In this case the following provisions shall apply.

Upon reception of a triggering signal, the AECC shall send data and establish voice connection with the PSAP.

If the sending of data failed then the AECC shall retry sending the data.

If the AECC has successfully sent the data and then loses the voice connection, it shall try to re-establish voice connection.

In case it was not possible to establish voice connection and/or send data using mobile communication networks, the AECC shall store the data in non-volatile memory and attempt re-transmission of the data and to establish a voice connection.

- 7.2. If the applicant for approval so requests the Electro Magnetic Compatibility may be part of the approval of a type of AECC. In this case the following provisions shall apply.
- The effectiveness of AECC shall not be adversely affected by magnetic or electrical fields. This shall be demonstrated by compliance with the technical requirements and transitional provisions of Regulation No. 10, 04 series of amendments or any later series of amendments.
- 7.3 Position determination
- If the AECC is fitted, in accordance with paragraph 1.4., with GNSS receiver supporting at least three GNSS including GLONASS, Galileo and GPS, and is capable of reception and processing of SBAS signals, then the AECC shall comply with the requirements of paragraphs 7.2.1 to 7.2.11.
- AECC compliance with respect to positioning capabilities shall be demonstrated by performing test methods described in Annex 8: Test methods for the navigation module.
- 7.3.1 The GNSS receiver shall be able to output the navigation solution in a NMEA-0183 protocol format (RMC, GGA, VTG, GSA and GSV message). The AECC setup for NMEA-0183 messages output shall be described in the operation manual.
- 7.3.2 The GNSS receiver being a part of the AECC shall be capable of receiving and processing individual GNSS signals in L1/E1 band from at least three global navigation satellite systems, including GLONASS, GALILEO and GPS.
- 7.3.3 The GNSS receiver being a part of the AECC shall be capable of receiving and processing combined GNSS signals in L1/E1 band from at least three global navigation satellite systems, including GLONASS, GALILEO, GPS and SBAS.
- 7.3.4 The GNSS receiver being a part of the AECC shall be able to provide positioning information in WGS-84 coordinate systems.
- 7.3.5 Horizontal position error shall not exceed:
- under open sky conditions: 15 m at confidence level of 0.95 probability with Position Dilution of Precision (PDOP) in the range from 2.0 to 2.5;
 - in urban canyon conditions: 40 m at confidence level of 0.95 probability with Position Dilution of Precision (PDOP) in the range from 3.5. to 4.
- 7.3.6 The specified requirements for accuracy shall be provided:
- at speed range from 0 to 140 km/h;
 - linear acceleration range from 0 to 2 G.
- 7.3.7 Sensitivity at receiver input shall be:
- GNSS signals detection (cold start) do not exceed 3600 s at signal level on the antenna input of the AECD of minus 144 dBm;
 - GNSS signals tracking and navigation solution calculation is available for at least 600 sec at signal level on the antenna input of the AECD of minus 155 dBm;
 - Re-acquisition of GNSS signals and calculation of the navigation solution is possible and does not exceed 60 s at signal level on the antenna input of the AECD of minus 150 dBm.
- 7.3.8 Cold start time to first fix shall not exceed
- 60 s for signal level down to minus 130 dBm
 - 300 s for signal level down to minus 140 dBm

- 7.3.9 GNSS signal re-acquisition time after block out of 60 s at signal level down to minus 130 dBm shall not exceed 20 s after recovery of the navigation satellite visibility.
- 7.3.10 The GNSS receiver shall be able to obtain a position fix at least every second.
- 7.3.11. The testing procedures in Annex 8 can be performed either on the AECC unit including post processing ability or directly on the GNSS receiver being a part of the AECC.
- 7.4 Mean of access to mobile networks
- The AECC can be fitted with an embedded hardware allowing registration/authentication on, and access to a mobile network.
- 7.5 AECC information and warning signal
- If the applicant for approval so requests, the information and warning signals verification may be part of the approval of a type of AECC. In this case the following provisions shall apply.
- 7.5.1 The following information shall be provided regarding the status of the emergency call transaction when the AECC is automatically or manually activated:
- system is processing (ecall is triggered, connection is being set up ~~or~~ data transmission is in progress or completed ~~or voice call is in progress~~)
 - transmission failed (connection failed or data transmission failed)
- 7.5.2 A warning signal shall be provided in case of AECC internal malfunction. Visual indication of the AECC malfunction shall be displayed while the failure is present. It may be cancelled temporarily, but shall be repeated whenever the ignition or the vehicle master control switch is being activated (whatever applicable).

7.5.2.1

The manufacturer shall provide the type-approval authority with an explanation and technical documentation which shows, in overall terms, how **the malfunction indication strategy** is achieved. This documentation shall be maintained by the manufacturer and shall be made open for inspection by the technical service at the time of the type approval.

This shall at least cover the following items:

ITEM		Comments
Component	Failure type	
AECC Control Unit	Internal failure	Internal failure = e.g. hardware failure, watch-dog, software checksum, software image integrity, ...
Mobile network communication device	Electrical connection / module communication failure	A failure in the module can be detected by the absence of digital communication between the AECD control unit and the module.
Mobile network communication device	internal failure	Item necessary because it is a basic function: a failure implies that the AECS cannot perform its function.
GNSS receiver	Electrical connection / module communication failure	
GNSS receiver	Internal failure	
Mobile network communication antenna	Electrical connection	
GNSS antenna	Electrical connection	
Crash Control Unit	Electrical connection	e.g. crash detection sensor system, triggering device, ...
Crash Control Unit	Internal failure	If not in good condition, then the automatic emergency call is not possible. If CCU internal failure verification is not part of AECC approval (Part Ia), then it shall be subject to AECD approval (Part Ib) or AECS approval (Part II).
Back up power supply (if fitted)	Electrical connection	Dedicated battery is connected
SIM	not present	This item only applies if a removable SIM card is used.
Back-up power supply (if fitted)	The state of charge, threshold for warning at the discretion of the manufacturer	Failure if the state of charge is at a critical level according to the manufacturer.

Table 1: Template of information for self-test function

Verification of the performance of the AECC malfunction shall be conducted against the manufacturer's specification. This can be either by actual test or simulation-

7.5.2.2. Test procedure

Self-test function verification test

7.5.2.2.1. The following test shall be performed on an AECC on a representative arrangement of components.

7.5.2.2.2. Simulate a malfunction of the AECC system by introducing a critical failure in one or more of the items monitored by the self-test function according to the technical documentation provided by the manufacturer. The item(s) shall be selected at the discretion of the Technical Service.

7.5.2.2.3. Power the AECC up and verify that the AECC warning signal device illuminates shortly afterwards or the electrical signal is generated shortly afterward, whichever is relevant.

7.5.2.2.4. Power the AECC down and restore it to normal operation.

7.5.2.2.5. Power the AECC up and verify that the AECC warning signal device does not illuminate or extinguishes shortly after illuminating initially, or the electrical signal is not generated shortly afterward or is cancelled after being generated initially, whichever is relevant.

7.5.3. Instead of providing information or warning signal, the AECC may provide the electrical signal to other vehicle components, e.g. instrument panel, which enable to provide information or warning signal.

7.6. Power supply

7.6.1. In the case of an AECC equipped with a back-up power supply, at the request of the applicant, it shall be verified that the AECC is able to operate autonomously for a period of first not less than 5 minutes in voice communication mode followed by 60 minutes in call-back mode (idle mode, registered in a network) and finally not less than 5 minutes in voice communication mode.

7.6.2. In the case of an AECC not equipped with back-up power supply, the absence of back-up power supply shall be clearly indicated in the information document of Annex xxx (AECC information document format)

7.7. Resistance to impact

7.7.1. Perform the sled test described in Annex 7

7.7.2. The AECC and its connectors ¹ shall remain operational after impact.

7.7.3. For a control module and communication module by a verification of the MSD and HMI functionality according to paragraph 2.1 and 2.3 of Annex 9. For this purpose the AECC can immediately after the sled test be installed on a representative test bench that can simulate a trigger signal such to emit the MSD and read out the HMI functionality

7.7.4. For a mobile network antenna this shall be demonstrated by measuring the VSWR (Voltage Standing Wave Ratio) and verifying that VSWR satisfies the specifications prescribed by the manufacturer for this antennas in the post-crash conditions of the test.

7.7.5. For a power supply this shall be demonstrated by a battery test

- Verify that no cable connectors are unplugged during the event.
- Measure if the voltage and capacity corresponds to the manufacturer's specification.

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- Only connectors related to the parts listed in this paragraph
- The length of the harness, and when applicable its fixation, can be decided by the applicant, in agreement with the Technical Service, so that it is representative for the different installation configurations of the AECD.

8. Modification and extension of approval of the type of AECC

- 8.1 Every modification of the AECC type shall be notified to the administrative department which approved the AECC type. The department may then either:
- 8.1.1 Consider that the modifications made are unlikely to have an appreciable adverse effect, and that in any case the vehicle still complies with the requirements; or
- 8.1.2 Require a further test report from the technical service responsible for conducting the tests.
- 8.2 Notice of the confirmation of approval, specifying the alterations made, or refusal shall be communicated to the Parties to the Agreement applying this Regulation by means of a form conforming to the model in annex 1 to this Regulation.
- 8.3 The competent authority issuing the extension of approval shall assign a series number to each communication form drawn up for such extension.

9. Conformity of production

- 9.1 The conformity of production procedure shall comply with the requirements set out in the Agreement, Appendix 2 (E/ECE/324 E/ECE/TRANS/505/Rev.2).
- 9.2 Every AECC approved under this Regulation shall be so manufactured as to conform to the type approved by meeting the requirements set out in paragraph 7 above.

10. Penalties for non-conformity of production

- 10.1 The approval granted in respect of an AECC type pursuant to this Regulation may be withdrawn if the requirement laid down in paragraph 9.1 above is not complied with or if the AECC fails to pass the checks prescribed in paragraph 9.2 above.
- 10.2 If a Party to the Agreement which applies this Regulation withdraws an approval it has previously granted, it shall forthwith so notify the other Contracting Parties applying this Regulation by means of a copy of the approval form bearing at the end, in large letters, the signed and dated annotation "APPROVAL WITHDRAWN".

11. Production definitively discontinued

If the holder of the approval completely ceases to manufacture a vehicle type approved in accordance with this Regulation, he shall so inform the authority which granted the approval. Upon receiving the relevant communication, that authority shall inform thereof the other Parties to the Agreement which apply

this Regulation by means of a copy of the approval form bearing at the end, in large letters, the signed and dated annotation “PRODUCTION DISCONTINUED”.

12. **Names and addresses of technical services responsible for conducting approval tests, and of administrative departments**

The Parties to the Agreement which apply this Regulation shall communicate to the United Nations Secretariat the names and addresses of the technical services responsible for conducting approval tests and of the administrative departments which grant approval and to which forms certifying approval or refusal, or extension or withdrawal of approval, issued in other countries, are to be sent.

Part Ib: APPROVAL OF ACCIDENT EMERGENCY CALL DEVICES (AECD) WHICH ARE INTENDED TO BE FITTED TO VEHICLES OF CATEGORIES M1 AND N1

Start renumbering the paragraphs of this Part Ib from 13.

- 13. Definitions**
- 14. Application for approval**
- 15. Markings**
- 16. Approval**

Insert the following text in par. 16.1:

If the AECD application makes reference to AECC approval(s) obtained in accordance with Part Ia, the competent authority shall verify which requirements have been covered already by the AECC approval(s) and avoid any duplication of the related verifications.

- 17. Requirements**
- 18. Modifications of a type of AECD and extension of approval**
- 19. Conformity of production**
- 20. Penalties for non-conformity of production**
- 21. Production definitively discontinued**
- 22. Names and addresses of Technical Services....**

Annex xx

Communication

(Maximum format: A4 (210 x 297 mm))



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concerning⁴: Approval granted
Approval extended
Approval refused
Approval withdrawn
Production definitively discontinued

of a type of **AECC** intended to be fitted to vehicles of categories M1 and N1 pursuant **Part Ia** to Regulation No. AECS

Approval No. Extension No.

1. Trade name or mark of device:
 2. Manufacturer's name for the type of device:
 3. Manufacturer's name and address:
 4. If applicable, name and address of manufacturer's representative:
 5. Submitted for approval on:
 6. Technical Service responsible for conducting approval tests:
 7. Date of report issued by that Service.....
 8. Number of report issued by that Service.....
 9. Brief description of **AECC**
- Control module: yes/no**.....
- Communication module : yes/no**.....
- Back-up power supply : yes/no**.....
- Power supply : yes/no**.....
- Network access antenna : yes/no**.....
- information and warning signal: yes/no.....
- GNSS antenna: yes/no**.....
- GNSS receiver: yes/no**.....

¹ Distinguishing number of the country which has granted/extended/refused/withdrawn approval (see approval provisions in the Regulations).

⁴ Strike out what does not apply.

10. Component was tested according to the sled test of Annex 4.7 (components necessary for sending the MSD are by default tested to Annex 4.7—TCU, back up power supply, AECC information signal, GNSS antenna when internal to TCU, GNSS receiver when internal to the TCU):
- AECD warning signal: yes/no.....
 - Power supply other than back up battery: yes/no.....
 - par. 7. General requirement (optional): Yes/No.....
 - par. 7.1 EMC (optional): Yes/No.....
 - par. 7.2 Position determination (optional): Yes/No.....
 - par. 7.3 Mean of access to the network (optional): Yes/No.....
 - par. 7.4 Information and warning signal (optional): Yes/No.....
 - par. 7.5 Power supply (optional): Yes/No.....
 - par. 7.6 Resistance to impact (mandatory): Yes/No.....
11. Position of the approval mark:
12. Reason(s) for extension (if applicable):
13. Approval granted/refused/extended/withdrawn²:
14. Place:
15. Date:
16. Signature:
17. The list of documents deposited with the Type Approval Authority which has granted approval is annexed to this communication and may be obtained on request.

Annex xxx

Information document relating to the type approval of an emergency call Component (AECC)

The following information, if applicable, shall be supplied in triplicate and shall include a list of contents.

Any drawings shall be supplied in appropriate scale and in sufficient detail on size A4 paper or on a folder of A4 format.

Photographs, if any, shall show sufficient detail.

1. Make (trade name of manufacturer):
 2. Type and general commercial description(s):
 3. Means of identification of type, if marked on the device:
 4. Name and address of manufacturer:
 5. Location of and method of affixing the approval mark:
 6. Address(es) of assembly plant(s):
 7. Arrangement (indicate components covered by the application of this type approval):
 8. Description of method(s) of attachment to the vehicle (if applicable, dimensions, structure and materials of the attachments and supports of the device):
 9. Sufficiently detailed drawings to identify the complete **component**, including installation instructions (for aftermarket devices only); the position for the type-approval mark must be indicated on the drawings:
 10. Back-up power supply: yes/no.....
 11. Internal crash control unit: yes/no.....
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