

## Proposal for a Supplement to UN Regulation No. [157] (ALKS)

*Note:* the text of amendments was drafted by the experts from the European Commission (EC) and the Russian Federation in response to the issues raised by the expert from the Russian Federation at the 6<sup>th</sup> GRVA session. This version of the text was prepared by the expert from the Russian Federation after the Webex meeting of the interested Contracting Parties hosted by EC on 28 July 2020.

### I. Proposal

*Paragraph 5.2.5.*, delete the second subparagraph:

“5.2.5. The activated system shall detect the risk of collision in particular with another road user ahead or beside the vehicle, due to a decelerating lead vehicle, a cutting in vehicle or a suddenly appearing obstacle and shall automatically perform appropriate manoeuvres to minimize risks to safety of the vehicle occupants and other road users.

~~For conditions not specified in paragraphs 5.2.4., 5.2.5. or its subparagraphs, this shall be ensured at least to the level at which a competent and careful human driver could minimize the risks. This shall be demonstrated in the assessment carried out under Annex 4. and by taking guidance from Appendix 3 to Annex 4.”~~

*Add the new paragraph 5.2.6.* to read:

“5.2.6. **For conditions not specified in paragraphs 5.2.4., 5.2.5. or its subparagraphs, the performance of the system shall be ensured at least to the level at which a competent and careful human driver could minimize the risks. The attentive human driver performance model and related parameters in the traffic critical disturbance scenarios from Annex 3 may be taken as guidance. The capabilities of the system shall be demonstrated in the assessment carried out under Annex 4.”**

*Annex 1.*

*Item 11.2.*, amend to read:

“11.2. Information document: **see Addendum 1** form (Appendix 2 of Annex 4).....“

*Add the following paragraphs after item 19.2.:*

“19.2. If applicable, list the relevant parameters that will allow the identification of those vehicles that can be updated with the software represented by the R<sub>15X</sub>SWIN under item 19.1.: .....

**Addendum 1: Information document for automated lane keeping systems (refer to Appendix 1).“**

**Addendum 2: Contracting Parties where the vehicle manufacturer has declared that the ALKS had been assessed to comply with local traffic rules (refer to Appendix 2).“**

*Add Appendix 1 – the former Appendix 2 to Annex 4.*

Appendix (former) consider as Appendix 2. Header and the sentence before the table, amend to read:

**“Addendum 2 to Type approval Communication No ... concerning the type approval of a vehicle type with regard to ALKS pursuant to Regulation No. [157]**

Additional information

Contracting Parties ~~Party regions~~ where the vehicle manufacturer has declared that the ALKS had been assessed to comply with local traffic rules:”

*Annex 3, add the content of the former Appendix 3 to Annex 4.*

*Annex 4:*

*Paragraph 1., amend to read:*

**“The requirements of this Annex is are** intended to ensure that an acceptable thorough consideration of functional and operational safety for the automated system that provides the function(s) regulated by the ALKS Regulation has been performed by the manufacturer during the design and development processes and will continue to be done throughout the vehicle type lifecycle (design, development, production, field operation, decommissioning).

**The requirements cover ~~It covers~~** the documentation which must be disclosed by the manufacturer to the type-approval authority or the technical Service acting on its behalf (hereafter referred to as type-approval authority), for type approval purposes **and verification to be carried out by the type-approval authority.**

This documentation shall demonstrate that automated lane-keeping system meets the performance requirements specified in **paragraphs 5., 6., 7. and 8. of this UN Regulation, that it as that system** is designed and developed to operate in such a way that it is free of unreasonable safety risks to the driver, passengers, and other road users. ...”

*Paragraph 2.1., amend to read:*

“2.1. “The system” means a “*Higher-Level Electronic Control*” system and its electronic control system(s) that provide the automated ~~driving~~ **lane-keeping** function. This also includes any transmission links to or from other systems that are outside the scope of this Regulation that acts on the automated lane keeping function.”

*Paragraph 3.1.1. (a), amend to read:*

“3.1.1. Documentation shall be made available in three parts:

(a) Application for type approval: The information document which is submitted to the type approval authority at the time of type approval application shall contain brief information on the items listed in ~~Appendix 2~~ **Appendix 1 to Annex 2**. It will become part of the approval.”

*Add new paragraph 4.0. to read:*

“4.0. **Taking into account the results of the analysis of the manufacturer’s documentation package referred to in paragraph 3, the Type Approval Authority shall request the tests to be performed or witnessed by the Technical Service to check specific points arisen from the audit evaluation.**”

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Paragraph 4.1.1., amend to read:

“4.1.1. Verification of the function of "The System"

...

~~Tests according to this Annex shall take into account tests already conducted in Annex 5 of this Regulation.~~

**These tests can be based on scenarios listed in Annex 5 and/or on additional scenarios not covered by Annex 5.”**

Paragraph 4.1.1.1., amend to read:

“4.1.1.1. The ~~verification~~ **test** results shall correspond with the description, including the control strategies, provided by the manufacturer in paragraph 3.2. and shall comply with the requirements of this Regulation.”

Paragraph 4.2., amend to read:

“4.2. Simulation tool and mathematical models for verification of the safety concept may be used in accordance with Schedule 8 of Revision 3 of the 1958 Agreement, in particular for scenarios that are difficult on a test track or in real driving conditions. Manufacturers shall demonstrate the scope of the simulation tool, its validity for the scenario concerned as well as the validation performed for the simulation tool chain (correlation of the outcome with physical tests). **Simulation shall not substitute physical tests in Annex 5 to this UN Regulation.**”

Paragraph 6., delete:

**“6. ~~Reserved Communication to other Type Approval Authorities (Appendix 2) containing:~~**

- ~~(a) Description of the ODD and the high-level functional architecture focusing on the functions available to the driver, vehicle occupants and other road users.~~
- ~~(b) Test results during the verification process by the type approval authorities.”~~

Appendix 2 to Annex 4: move to Annex 1 as Appendix 1 to Annex 1.

Appendix 2 (former) to Annex 4:

Paragraph 7., amend to read:

**“7. Reserved**

**~~7. Verification and test by the authorities~~**

~~7.1. Verification of the basic function of "The System".....“~~

~~7.2. Examples for checking the system reaction under the influence of a failure or an operational disturbance, emergency conditions and boundary conditions.....“~~

Appendix 3 to Annex 4: move to Annex 3.

*Annex 5:*

*Paragraph 1., amend to read:*

“This annex defines tests with the purpose to verify the technical requirements on ALKS. **All tests from this Annex have to be performed or witnessed by the Technical Service during the approval process.**

Until such time that specific test provisions have been agreed, the ~~Technical Service shall ensure that the ALKS is subject to at least the tests outlined in Annex 5.~~ The specific test parameters for each test shall be selected by the Technical Service and shall be recorded in the test report in such a manner that allows traceability and repeatability of the test setup. ...”

*Paragraph 5.2., amend to read:*

“5.2. Compliance with the following provisions shall be demonstrated by the manufacturer **as part of the audit under Annex 4** and ~~assessed~~ **verified** by the Technical Service ~~at the time of type approval~~ **as part of the tests under section 4. and section 5.4. of this Annex.**”

## **II. Justification**

*Paragraphs 5.2.5., 5.2.6.*

The second subparagraph of paragraph 5.2.5 was moved to the new paragraph 5.2.6. as it has generalizing meaning. Appendix 3 to Annex 4 is considered to become a separate Annex 3. The content of Annex 3 is described in paragraph 5.2.6. more precisely.

*Annex 1.*

There are two addenda to the Communication on type-approval. To regularize the content of the Communication, the form of the information document of Appendix 2 to Annex 4 was moved to Annex 1 and became Appendix 1 to Annex 1. The reference to this Appendix in item 11.2. was amended respectively. The Appendix without number to Annex 1 became Appendix 2. The reference to the data in these Appendices was added after item 19.2.

*Annex 1, Appendix (former), Header and the sentence before the table.*

“2” is added after “Addendum” as there are two addenda and this one became the 2<sup>nd</sup>.

In the table, the entire countries are mentioned, not the country regions.

*Annex 4.*

*Paragraph 1.*

The reference is made to the requirements of the Annex as they include requirements for documentation and to the verification conducted by the type-approval authority.

The link is provided to the specific provisions of the core text of the UN Regulation. The text is amended to clarify that manufacturers shall submit evidence of compliance with those provisions.

*Paragraph 2.1.*

Clarification is added to ensure that “the system” referred to in Annex 4 is that providing the automated lane-keeping function.

*Paragraph 3.1.1. (a).*

Correction of the reference as Appendix 2 was moved to Annex 1.

*Paragraphs 4.0., 4.1.1.*

Clarification on performing the tests emphasising the role of the approval authority.

*Paragraph 4.1.1.1.*

This provision refers to the tests, not to verification.

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*Paragraph 4.2.*

Clarification that simulation shall not substitute physical tests in Annex 5 to this UN Regulation.

*Paragraph 6.*

This paragraph is not needed as Appendix 2 was moved to Annex 1.

*Appendix 2 (former) to Annex 4.*

Section 7 is not logic in Appendix 2, because Appendix 2 is the form of the Information Document for ALKS to be provided by a manufacturer before the approval process.

*Appendix 3 (former) to Annex 4.*

Appendix 3 to Annex 4 is considered to become a separate Annex 3. This was done to clarify the implementation of its content.

*Annex 5.*

*Paragraphs 1.and 5.2.:*

Clarification of the role of the Technical Service.

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