

## **Special Interest Group on UN-R 157- 6<sup>th</sup> meeting**

- Date and time: 10 & 11 June 2021, 12.00-15.00 (CET/ Geneva time)
- Attendance: Leadership (EC, UK, DE), Group attendees (~61)

### **Summary:**

- Agenda and notes of 5<sup>th</sup> meeting approved without changes.
- Report of outcomes 10<sup>th</sup> GRVA session (May 2021):  
The two proposals of the group regarding the detection of emergency/enforcement vehicles and the scope extension for other vehicle categories (heavy duty vehicles) were presented to GRVA. After review and detailed discussion, GRVA decided to submit documents GRVA-10-35 and GRVA-10-36 to WP.29 and AC.1 for consideration and vote at their November 2021 sessions, subject to final review by GRVA at its next September 2021 session. GRVA tasked SIG ALKS to consider again the issue related to appropriate wording for “detectable/significant collisions”. The IWG on EDR/DSSAD (in particular SG DSSAD) raised interest to review the requirements on data retrievability in the scope extension proposal for heavy duty vehicles (GRVA-10-36, para. 8.4.3.). All SIG members are encouraged to follow these continued discussions in SG DSSAD.
- Consideration of amendments clarifying current UN-R157:
  - a. Open issue on “detectable collisions”: the new proposal prepared by UK/leadership (UNR157-06-06) was not discussed within 6<sup>th</sup> SIG meeting due to time limitations; it will be subject of discussions in next SIG meeting. Everyone asked to review and send written comments or amendments in advance of next meeting, if necessary.
  - b. No new revision of proposal GRVA/2021/2 was provided by OICA so the group agreed to revisit this item at the next meeting.
  - c. Improvement in the audit and in-use requirements: JRC/EC proposals for this topic (UNR157-04-05 and UNR157-04-06) were not discussed in 6<sup>th</sup> meeting due to time constraints. Joint review of the proposals and more detailed discussion expected in

next SIG meeting. Everyone asked to review and send written comments or amendments in advance of next meeting, if necessary.

- Lane change and speed increase:

*Evasive manoeuvre*

Industry introduced proposal UNR157-05-11 on emergency manoeuvre (EM) lane crossing. Discussion took place on redefining the definition to avoid having to wait for the imminent risk of collision condition. SE noted the emergency manoeuvre should be a rare case and that systems should not enter the emergency conditions frequently. JP unsatisfied with current definition for EM lane crossing since it is too vague in their view. JP presented their understanding of three theoretical concepts for EM lane crossing (UNR157-06-05) and highlighted they only support an EM lane crossing when braking is not sufficient. Furthermore JP pointed out again the necessity of a clear distinction between lane changes in “nominal/regular” and emergency condition. DE raised the importance to keep clear distinction between a lane crossing manoeuvre and (full) lane change. UK asked for reasoning of 30 cm in industry proposal as “(maximum) lane crossing boundary” and if such value is needed in general. OICA explained the values(s) in their initial proposal could be in square brackets and confirm they need discussion; the proposed value of 30 cm results from LDWS. Group conclusion: enlarging “toolbox” of system to mitigate or avoid risk of collisions is generally supported, yet link to anticipatory behaviour needs to be made. OICA will try to improve text proposal. Document UNR157-05-07 will be cleaned and prepared for next meeting by co-chairs.

*Minimum Risk Manoeuvre Lane Change (MRM LC)*

UK presented again their original proposal on MRM LC using document UNR157-05-07, followed by an extensive group discussion on LC provisions, in particular parameter for assessing target lane (para. 5.2.6.6.1., option 1). OICA noted parameters ‘B’ (reaction time) and ‘C’ (safety gap) need to be more specific with the dynamics of the situation. DE explained how the parameters suggested in their original proposal for LC were derived using document UNR157-05-07 (for further detailed information please also see UNR157-06-09). JRC/EC noted that 0.4 s and 1.4 s for parameter ‘B’ seem a bit arbitrary and ask for justification. JRC/EC mentioned that these values might be conservative at

low speed but should be more adequate at higher speed. OICA explained the concept and values were derived from ACSF C and stated the TTC-approach proposed by JRC/EC (para. 5.2.6.6.1., option 2) does not cover all circumstances. For example for high speeds TTC calculation mathematically works, but for exactly the same speed of two vehicles TTC would be infinite, theoretically allowing a few centimetres distance only.

JP highlighted the RMF proposal (WP.29-184-05) could be used as basis for MRM LC requirements; JP checked the RMF proposal and highlighted to the group which parts could be used for ALKS MRM LC discussion (UNR157-06-08, marked in yellow). Co-chairs offered to merge RMF text with existing LC proposals and prepare update of UNR157-05-07; industry willing to support drafting/merging activity. JP expressed their view again the group should concentrate on MRM LC. OICA expressed provisions for “nominal/regular” LC presumably not too different from MRM LC, therefore effort to introduce later will duplicate the effort.

Industry proposed ALKS above 100 km/h to obligatorily conduct MRM LC (UNR157-06-07, para. 5.2.3.1.). JP questioned why above 100 km/h and not e.g. above 60 km/h, since stopping in lane was supposed to be limited to dense traffic. JP considers evasive manoeuvre in MRM optional, but MRM LC for over 60 km/h should be mandatory. SE finds the text proposed by industry unclear. DE stated they generally consider industry’s proposal a good step to make the MRM LC mandatory, yet also the evasive manoeuvre as further possible system reaction should be taken into account as well. Group conclusion: Text tentatively agreed with 60 km/h instead of 100 km/h.

#### *LC testing section*

Industry introduced their proposal using document UNR157-05-07. JRC/EC explained their parts in this document, for example the addition of extra elements from what they had provided to VMAD and have now adapted to fit ALKS use case. OICA asked if some of the additions are irrespective of LC and stated they need to check if these proposed new provisions by JRC are already captured and addressed elsewhere in UN-R 157. JRC/EC confirmed their proposed additions are not only linked to LC. Furthermore, JRC/EC explained they are looking at the division between track and on-road testing and will provide further text.

*String stability/anticipatory behaviour*

Industry introduced a first proposal to find wording to address “anticipatory behaviour” of the system (UNR157-06-07, para. 5.1.1.x.). JP mentioned anticipatory behaviour (for a human driver) is only recommendation in Japan, not a safety requirement. JP therefore thinks it is too early to introduce such a requirement in UN-R 157 and set parameter for ALKS. DE welcomed industry’s proposal as first draft and think it is a step in the right direction; supported by JRC/EC. JRC furthermore mentioned they are currently performing validation of their model for string stability to determine what is avoidable and unavoidable.

*Following distance*

Industry presented compromise and modifications required when deleting the table with values for minimum following distance (UNR157-06.07, para. 5.2.3.3.). This was supported by EC and DE. JP wishes to keep table with values for minimum following distance up to 60 km/h and suggest to delete it for above 60 km/h (JP explained they nationally do not have a 2 s-TTC rule or the like, so in their view there is no basis to extend the table above 60 km/h). Group conclusion: Deleting the table to be confirmed for the next meeting. Alternatively the table will be kept with values for minimum following distance only to be maintained for up to 60 km/h; above 60 km/h general requirements (e.g. requesting compliance with local traffic rules) sufficient.

*General system capabilities*

Proposal by JRC/EC to amend para. 5.2.4. regarding the expected system’s behaviour e.g. in case of an obstructed path/blocked lane of travel was discussed using industry’s response in document UNR157-06-07. Group conclusion: only delete the word ‘stationary’ from ‘stationary road user’ and beside this keep para. 5.2.4. as it is. Industry suggested deleting the proposed requirement from DE in para. 5.4.2. (UNR157-06-07, blue text/strikethrough), since they find provisions in UN-R 157 (e.g. para. 5.1.8. (tempering and misuse) or para. 6.1.3. (driver availability)) to sufficiently cover DE concerns. Group conclusion: follow industry’s suggestion and delete blue text.

*Wrong way driver*

Proposal by industry for wrong way driver (UNR157-06-07, para. 5.2.5. blue text) to be kept in square brackets for now and to resume discussion in next meeting. In principle text supported by JRC/EC and DE.

*Detection range*

SE expressed strong view the forward detection range in para. 7.1.1 should be calculated using braking performance of 3,7 m/s<sup>2</sup> (UNR157-05-06), since 5m/s<sup>2</sup> does not fulfil expectation to detect/stop in front of standing still humans (vulnerable road users), large animals or objects. In addition, SE considered that 5m/s<sup>2</sup> is not reachable at bad/slippery road or weather conditions, which could be crucial because ALKS is not necessarily limited to operate at such difficult environmental conditions (SE therefore in favour of more conservative approach to ensure safety). OICA recalled that 5m/s<sup>2</sup> reflected more the state of the art of current vehicles on wet roads and that requiring a 3,7 m/s<sup>2</sup> in all conditions was not necessary. OICA sees that there is a lot of time to react given the braking capability of the vehicle. Discussion could not be concluded due to time constraints in the meeting; to be continued in next meeting.

*Scenarios*

No time to discuss; to be continued in next meeting.

## - AOB:

Following the request of JP, the next meeting is scheduled at an earlier time in order to accommodate the participation of Asian colleagues (9.00-12.00 CET instead of previously 12.00-15.00 CET). No objections were raised from participating members to this request.

**Action points for next meeting:**

- Everyone to review proposals and contribute with further input on speed increase and lane change (in particular MRM LC and evasive manoeuvre).

**Next meetings:**

- 08-09<sup>th</sup> July 2021 (09.00-12.00 CET)
- 13<sup>th</sup> & 17<sup>th</sup> Sep 2021 (12.00-15.00 CET)