Special Interest Group on UN-R 157- 7th meeting

- Date and time: 08 & 09 July 2021, 09.00-12.00 (CET/ Geneva time)
- Attendance: Leadership (EC, UK, DE), Group attendees (~62)

Summary:

- Notes of 6th meeting and agenda of 7th meeting approved without changes.

- Consideration of amendments clarifying current UN-R157:
  a. Open issue on "detectable collisions": Proposal prepared by UK/leadership (UNR157-06-06) was not discussed due to time constraints.
  b. No new revision of proposal GRVA/2021/2 was provided by OICA; topic will be revisited as soon as input has been provided.
  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 due to time constraints.

- Lane change (LC) and speed increase:
  a. Higher speed (UNR 157-07-03):

  Anticipatory behaviour

  No changes were suggested to the industry text so it would be taken forward as is.

  Clarifications

  Modification of para. 5.2.1. suggested by EC (UNR157-03-06) was agreed, however the need to include the addition to para. 5.2. would be reviewed by leadership as not considered to be necessary since it is already covered in the current ALKS text.

  Allowing higher speeds with no lane change capability

  Industry see that there is no additional risk to stopping in the slowest lane so consider that the operational speed can be increased beyond 60km/h if the vehicle remains in the slow lane even without lane change capability, however, would be limited to 60km/h for all other lanes. JP raised concerns about collisions if a vehicle stops in the slowest lane because it didn't at least have Minimum Risk Manoeuvre (MRM) LC capability. UK shared the concerns of JP and that it was not acceptable, especially in free-flowing traffic,

to stop in lane when the vehicle can move off the carriageway. DE noted that the LC capability would need to be clear at type approval to ensure systems are approved appropriately in such cases. Industry put forward an idea to limit it to dense traffic situations and would provide a new proposal for the group to review at the next meeting.

Parameters for safety distances

JP requested that the table for minimum following distances remained in 5.2.3.3. up to 60km/h. That was agreed to along with the other proposed changes for that paragraph. Also agreed was not to remove 'stationary' from para. 5.2.4.. Leadership to review the proposed changes to para. 5.2.5.1. since the table was retained.

Wrong way driver

Agreement to add the additional text concerning wrong way driver, although UK noted that para 5.2.5. may not be the most appropriate place for the requirement. Leadership to review where best to incorporate it.

Driver model

JRC presented further details on their fuzzy safety model (FSM) (UNR157-07-06). JP noted that their careful and competent (C&C) driver model was based on detailed analysis and were in favour of seeing more detailed justification for the FSM. They were also concerned about false positives resulting in safety issues. They highlighted that the C&C model is all the events that must be avoided and were worried that it was too soon to mandate the anticipatory behaviour generated by the FSM, therefore JP, wanted to retain the C&C model in Annex 3. DE asked if the FSM would replace the C&C model and the TTC concept. JRC confirmed it had the potential to cover both. Industry presented UNR157-07-14 to explain their concerns with the FSM, in particular with it generating false positives due to the wandering in lane of vehicles and also significant decelerations when not necessary. DE asks JRC if TTC formula with earlier reaction time (e.g. if calculation point of the formula is placed on the lane marking, i.e. 30 cm earlier) could be taken into account to better compare the safety benefits of both approaches. Leadership proposed to incorporate the FSM as guidance so that it could be evaluated and reviewed in the future whilst retaining the C&C model and the TTC concept, which was agreed. Leadership would revise the text accordingly.

Pedestrian Scenario

UK raised concerns that the proposal to limit the requirements of para. 5.2.5.3. to 60km/h could give the impression that the vehicle had to do nothing above that speed if it detected a pedestrian. UK to propose wording similar to wrong way driver so the vehicle should take mitigating action.

Detection range

Industry presented UNR157-07-13 which contained evidence showing that a braking performance above 5m/s^2 was achieved in most circumstances. They also noted that they see the detection range as the point where 100% detection is achieved and that there would be strategies to respond at greater distances but it would not be a complete response. Agreed to take forward the values in square brackets which are based on 5m/s^2.

String stability

JRC noted their preference to keep the text since current Adaptive Cruise Control (ACC) is not stable. The industry raised concerns about the requirements creating unknown constraints with its pass/fail criteria. JP considered that string stability is only an issue with multiple ADS vehicles so it is possibly a bit early to introduce a requirement now when there will be so little ADS vehicles on the road. Agreed to set string stability as general requirements. JRC, industry and leadership to work on the text to be incorporated.

b. Lane Change (UNR157-07-04)

Definitions

JP was against the changes to "Emergency Manoeuvre" definition and noted their proposal for "Evasive Manoeuvre" (UNR157-06-05) as a way forward. No agreement so would be placed in square brackets.

JP noted that 'beside the road' would be a possibility for an MRM LC therefore needed included within the definitions. Industry had some reservations but it was agreed to take onboard. Leadership would check the drafting.

General provisions

Industry noted that crossing the lane markings could happen when creating an emergency corridor. Agreed not to list the exceptions and simply state that there should be no unintentional crossing of lane markings.

LC Procedure (LCP)

JP noted reference was needed to Annex 3 in para. 5.2.6. since Appendix 3 of Annex 4 was moved. To be checked by leadership.

JP highlighted that a lane change to the hard shoulder should only happen in an emergency, although it was noted that some hard shoulders can be used for normal traffic situations. Agreed to add reference to traffic rules to address this issue.

Industry noted that para. 5.2.6.4. was probably superfluous given that ALKS can only operate on divided highways. Leadership would check if needed.

The phrase "positively confirmed" in para. 5.2.6.6.(c) was seen as confusing. Industry would look to redo the wording noting it was supposed to cover the opening up of a gap.

Industry noted that para. 5.2.6.7.3. is excessive given that there would have already been a transition demand and therefore no need to delay the start as per the text from RMF proposal. Agreed to be put in square brackets and checked if needed.

UK raised concerns that para 5.2.6.7.4. would mean the vehicle would not continue to look to find a gap and would stop in lane even though an opportunity to perform a LC may subsequently appear. Industry questioned whether it was needed. Leadership to check this and other provisions taken from RMF.

JP were requested to review if it was necessary to include the additional requirements for bringing a vehicle to a stop beside the road taken from the RMF text since ALKS would be operating only on motorways.

Assessment of target lane

Industry highlighted that they would be unable to change lane if they were required to maintain the minimum following distances as proposed by para. 5.2.6.9.. Also noted that maintaining following distances during the LC could require disruptive changes in speed.

JRC were concerned that a vehicle could move into a dangerous situation if distances were not maintained. To be revisited since no conclusion.

UK pointed out that an ALKS vehicle should avoid causing a vehicle to decelerate if behaving like a careful and competent driver and that the values for assessing criticality being proposed in para. 5.2.6.9.1. should be the worst case of what is acceptable. UK to propose some wording to ensure that it is not standard practice to cause other vehicles to decelerate during a LC.

Industry questioned the need for para. 5.2.6.9.2. when the criticality is assessed at the point the lane marking is crossed. UK recalled that it was included to allow flexibility on the criticality depending on the changing speeds of vehicles but would clarify and review the provision.

JP noted that a lot of drivers do not comply with the maximum speed so requested that an additional 30km/h is added to the maximum in para 5.2.6.9.3.. Tentative agreement that the assumption would be the maximum permitted +30km/h up to a maximum of 130km/h.

Sensing requirements

JP introduce proposed requirements for para. 7.1.1.1. and 7.1.2.1. that would require for regular lane change the sensing capability to not only detect in the target lane but also the lane beyond the target lane. Industry pointed out that the system would assess each lane change at a time therefore not necessary to have such a wide sensing capability. Subject to further discussion.

There was no time left to discuss the other elements of the LC proposal.

c. Horizontal

Not discussed or any proposals made

- AOB:

  Following the request of JP in the 6th SIG meeting, the 8th (and next) meeting will also be 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.

- Coordination of work: IWG EDR/DSSAD Secretary gave a brief summary of the work done in EDR/DSSAD and SG DSSAD group on reviewing the Heavy Duty ALKS proposal (GRVA-10-36) and presented their revised version. There was no fundamental disagreement, but further improvement to wording was considered necessary. Particularly around ensuring that the requirements don't constrain where the data can be stored but also that the data can be retrieved from the vehicle in any case which has been subject to a severe impact. IWG EDR/DSSAD chairs and SIG leaderships to improve text.

Action points for next meeting:

- Everyone to review the documents for speed increase and lane change, which shall be sent to GRVA in September 2021.

Next meetings:

- 13th & 17th Sep 2021 (09.00-11.00 CET)
- 7th & 8th October 2021 (12.00-15.00 CET)
- 8th & 9th November 2021 (09.00-11.00 CET)
- 9th & 10th December 2021 (TBC)