DRAFT Report

20th meeting of the GRVA informal working group on Automatically Commanded Steering Function (ACSF)

Venues: Liverpool (UK) – for details see ACSF-20-02
Chairman: Mr. Hiroshi Morimoto (Japan) and Mr. Christian Theis (Germany)
Secretariat: Mr. Rudolf Gerlach (TÜV Rheinland)
Duration of the sessions:
Tuesday, 06. November 2018: starting at 1:00 p.m.
Thursday, 08. November 2018: ending at 5:00 p.m.

Note: Any comments or documents relating to this meeting should be sent to the secretariat (gerlach@de.tuv.com) in e-format, so that meeting documents can be made available to the UNECE secretariat for publication on the website of WP29.

1. Welcome and Introduction

Chair – overview of GRVA. Clear guidance that the group should proceed with a new regulation rather than amending UN-R 79. The requirements should be drafted such that they also can be adopted as a GTR under the 98 Agreement. There were revised ToR adopted at GRVA. Recommendation to focus on the low-speed application of an automated lane keep function in order to deliver a document that can be considered at the January 2019 session of GRVA.
INDUSTRY – do not believe that GRVA gave guidance to focus on the low-speed and would like to postpone making this choice until the end of January. The decision should be based on the progress made at this meeting.
Chair – there is still the argument that having these discrete classes ensures the customer is clear on the limitations of their system.
UK – we have been asked to deliver with more speed, and so prioritisation is necessary. It is not about choosing one item over another, but to ensure that we can deliver. I have also heard from industry that the technology is not ready for high-speed highway capability, which is why this could come as a second priority. GRVA sought clarity on the industry priorities, but the message from industry is that it is all important (including urban). Our priority should be to focus on those technologies that are close to market.
INDUSTRY – we are not ready to do 130km/h, but there are systems that could be ready in a short time capable of delivering 100km/h. Do not see why these systems should be prohibited from coming to the market if they are safe.
Chair – a safety corridor is required at higher speeds compared with a traffic jam system. There may be additional requirements for a system that operates at higher speeds.
UK – if we can deliver requirements for TJP speedily and deliver something else in parallel that would not be a problem. Delivering something in January does not mean we have to wait until 2021 to deliver some further requirements for other systems. Do not believe we will deliver something for January unless we restrict ourselves to a subset.
INDUSTRY – can we define how we will deliver the different packages? There are systems for different speeds, also heavy vehicles. For example, have a small group to think about how the low-speed text can be adopted for use with heavy vehicles.
UK – as chair of GRVA, happy for people to have discussions outside of this meeting about how to deliver requirements for other systems / vehicles. There have been suggested that despite to change in WP.29, there has been no change (i.e. that ACSF continues the same and AutoVeh exists). This is not true and there has to be a significant change in the way we work. ACSF will

deliver something, but going forward there will be something else. AutoVeh no longer exists and the 3-pillar approach has not yet been agreed. This group has a clear mandate and we can narrow our focus to deliver something that industry needs to bring products to market.
Germany – it is clear that we are developing requirements for a Level 3 lane keeping function for M1 vehicles operating on a highway. Higher speeds would increase the requirements we need to set. Decision to focus on a lower-speed function allows us to deliver something to GRVA in January. The next meeting of ACSF will be the last, as this group will no longer exist after 2nd session of GRVA.
INDUSTRY – can agree to start with developing requirements for the low-speed this week and then decide if higher speeds are possible.

2. Approval of the agenda

Document: ACSF-20-03-Rev.1 (Chair) Agenda of the 20th session

Revised Agenda adopted

General remarks:

INDUSTRY – do not believe that the attendance should be limited based on the size of the room. This creates issues with the competition law if some manufacturers are unable to attend.
Chair – should we limit it to only two persons per industry body so that there are no manufacturers disadvantaged?
INDUSTRY – that may be what has to be done based on the competition law, but leads to less efficiency in the meeting. Idustry would prefer to have no limitations on attendance . Additional persons could sit on chairs without desks. The group should find bigger rooms to accommodate a larger group.
Chair – how many seats does OICA & CLEPA need to participate fully? Also, there are limitations on the room size due to things like health & safety.
Secretary – there are some CPs not in attendance here, so we would need a significantly larger room to accommodate everyone. This would be very challenging.

3. Adoption of the report of the 18th and 19th meeting of the IWG on ACSF

Document: ACSF-18-11-Rev 1 - (Secretary) - Report 18th session

Adopted at the beginning of the 20th session

Document: ACSF-19-11 - (Secretary) Report 19th session

Adopted at the end of 20th session

Secretary – there are both, the report of the 18th session and draft report of the 19th session to be adopted.
Chair – please review the minutes over the week so that they can be adopted on Thursday.

4. Discussion on requirements for an automated lane keeping system

Documents:
ACSF-20-04 - (Secretary) consolidated version - proposal for technical requirements of an ALKS

ACSF-20-05 - (OICA-CLEPA) industry input - B2_Traffic Situations
ACSF-20-06 - (OICA-CLEPA) industry proposal - Chapters 2_6 until 2_10_Oct-30-2018
ACSF-20-07 - (OICA-CLEPA) Industry proposals - Definitions
ACSF-20-08 - (Republic of Korea) Minimum Safety Distance to the front
ACSF-20-09 - (Republic of Korea) Safety considerations on Emergency Manoeuver
ACSF-20-10 - (EC) consolidated version - proposal for technical requirements of an ALKS-EC
ACSF-20-12 - (Canada) Automated driving systems Taxonomy SAE J3016
ACSF-20-13 - (Republic of Korea) consolidated version - proposal for technical requirements of an ALKS
ACSF-20-14 - (UK) Determination of Operating Speed
ACSF-20-15 - (OICA-CLEPA) Update 2.8
ACSF-20-16 - (Secretary) Principles for chapters 2_6 until 2_10
ACSF-20-17 - (Republic of Korea) The comparison of warning effectiveness

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ACSF-20-04 (Secretary) "Consolidated Version of ACSF-19-09 und ACSF-19-03"

Document includes both German and Industry text.

Germany – system behaviour during a transition and unexpected event were discussed at the last meeting (ACSF-19-10), but we did not consider the text (paragraphs 2.6. to 2.10.). Text in ACSF-20-04 does not reflect what was agreed based on the drawings at the last session, so propose starting with the proposals from industry for these paragraphs.

ACSF-19-10 (Germany)

INDUSTRY – speed reduction should be allowed from the start of the transition demand rather than having to wait 4 seconds.

Germany – the first slide example is to cover the situations when there is no danger.

INDUSTRY – haptic warnings at very low speed could result in the vehicle coming to a standstill, or may not be sufficient to alert the driver.

Germany – haptic warning does not have to be brake jerks, it could be something in the vehicle that doesn't affect the speed (e.g. seat belt jerks).

ACSF-20-06 (OICA-CLEPA)

Germany – driver's availability was previously checked by at least two independent means.

INDUSTRY – following the presentation from the last meeting, a single camera system can be used to check that the driver is present and also that they are awake, so one mean can be enough.

Germany – there needs to be a redundancy to cover the transition period if a camera fails.

INDUSTRY – there are two requirements to detect that the driver is available and present in the seat. Written like this, it is technology neutral.

Chair – seat belt minders are already mandated, so what is the issue? This is already one mean, plus there will need to be a second.

INDUSTRY – can add to the end of 2.6.1. that driver's presence in the seat shall at least be detected by the seat belt status.

EC – query about the difference between the requirements for level 3 and level 4. Are we allowing secondary tasks?

Chair – only a lane keeping function cannot be level 4.

INDUSTRY – we can work on text for three checks (seat belt minder, seat belt buckled, driver present).

UK – what is meant by "driver being available"? Being present and having eyes open is not sufficient to say a driver is available, for example, if they are doing a secondary task with headphones on.

INDUSTRY – of course we would be interested in a system that would allow the driver to undertake secondary tasks. Otherwise, it would be a level 2 system and it is a different discussion.

NL – agree with INDUSTRY that we have already decided this and the driver will engage in other tasks if we allow them to go hands-off. But we need more in the requirements, as you could be awake with the seat fully reclined and so you are no longer available to take over. The more the driver is allowed to do, the longer the transition time.

UK – we cannot make a decision on allowing drivers to undertake secondary tasks. WP.1 expects WP.29 to inform them how we have the confidence on the robustness of the technology to allow the driver to undertake other tasks.

Sweden – "as soon as the driver is no longer detected". Should this not say "If the driver is no longer detected."

UK – proposed changes to paras 2.6.1. and 2.6.2. to add some clarity.

Germany – previously had different system reactions for the driver unavailable and the driver not in the seat.

NL – suggest that a definition is required for "driver availability", which was supported by UK.

UK – need to also understand what is meant by "awake".

Chair – would like to know from industry what is measured given that there is technology ready to come to market already.

INDUSTRY – unable to share at this meeting due to competition law and manufacturers do not want to disclose what they are doing.

UK – do not want to write something into the regulation that is specific to one technology. However, we need to define measurable performance requirements. Industry should be able to define that parameter without giving away individual manufacturer secrets as to how they are measuring those parameters.

Germany – without guidelines, every technical service will have their own opinion on how to measure "driver availability" / "driver awake".

INDUSTRY – we already shared a presentation about technology (ACSF-19-04). What is requested from the group in addition?

UK – 19-04 was a helpful document, but it does not identify what we can use as a pass/fail criteria when assessing a system.

INDUSTRY – systems may learn driver behaviour, so adding blink rates, for example, may be contradictory with the capabilities of the technology.

UK – likely to have these difficulties may times over the next few years as the technology matures. Need a performance requirement for a technical service to assess against. Can we develop something week that allows you to bring the current technologies to market next year, whilst recognising that we may need to make changes going forward for future technologies?

INDUSTRY – could have a requirement for some minimum action(s) every so often to verify that the driver is available.

UK – agree with the proposal by INDUSTRY to make sure there is some sort of regular action from the driver to understand that they are available.

Chair – INDUSTRY to draft proposed text for the next meeting. Please also review the text that is ACSF-20-04.

Japan – manufacturer should submit their specification along with their in-house testing and validation for the driver availability.

INDUSTRY – either we have tests that are witnessed, or the manufacturer makes a declaration and provides documentation of their evidence.

Discussion on paragraph 2.7.

Japan – the system should keep the lane at least for 10 seconds after a system failure (e.g. keep the lane if the camera system fails). Supported by NL.

NL – system should react immediately to an unexpected event. For a failure, there should be redundancy to cover operation for the full transition demand and then an MRM.

UK – do we need to be clear what is meant by system and function? INDUSTRY should consider separately how the system handles a failure in the vehicle that has an impact (e.g. a tyre blow-out).

Germany – what is meant by "the driver is not responding to a transition demand" and also "manual control"?

INDUSTRY – we still need to define what is meant by "manual control".

Germany – propose the transition demand consists of a haptic warning plus one of acoustic and optical.

ROK – how can an optical warning be escalated?

Chair (Japan) – it could be a flashing signal.

INDUSTRY – we tried to draft text that is technology neutral. Escalating an optical warning can be done by changing colour, flashing, making it bigger, apply to a different screen. The other option is to use another type (acoustic / haptic) as part of the escalation.

Germany – expect the vehicle to continue operation if the driver has not resumed control during the transition demand, even if the vehicle comes to standstill.

INDUSTRY – want to create urgency with a transition demand, which is why we propose that the vehicle comes to standstill it does not then drive off again. Detecting manual takeover is also difficult to detect when the vehicle has come to a standstill, as you cannot accelerate.

Germany – understand the technical challenge, but you could ask the driver to confirm takeover by pressing a button.

Chair – there are ways to assess manual takeover when the vehicle is at a standstill.

NL – the system will be redundant during the transition demand, so it should be capable to continue operating during that time period.

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ROK – optical and haptic warning is the best option for transition demand.

Chair – continue discussion on para 2.7.5. with regards to terminating the transition demand if the vehicle comes to standstill.

INDUSTRY – do not see it being a safe condition if the vehicle starts moving again after coming to a standstill after the start of a transition demand.

Chair – what is the intention with terminating the transition demand? I expect that after the vehicle comes to a standstill, the transition demand would still exist.

INDUSTRY – there are other paragraphs in the document to indicate to the driver to takeover once the transition demand has terminated. Could change the text to clarify that there will be an indication to the driver to takeover once the vehicle comes to a standstill, but only an optical signal.

Germany – I see a conflict with traffic law, as once the vehicle comes to standstill, it is then blocking the lane.

NL – can delete "standstill" line in para 2.7.5., as this is covered in para 2.7.2.

UK – we are not discussing behaviour in a normal controlled situation. Agree with industry that it does not make sense to allow the vehicle to move off again in a situation where the vehicle does not understand the situation.

NL – the vehicle shall be redundant to cover the transition demand period.

UK – if operation is on a redundant system is only a backup, so still query if it is safe to allow the vehicle to move off again when it now has no backup option any more.

NL – I can agree that it doesn't make sense to move off again, but it should be necessary to have a redundant system for the transition period.

EC – is standstill in the middle of a lane the safest condition? For example, if I fall asleep and the vehicle comes to a standstill, it will stop asking me to take back control.

INDUSTRY – do not think it is helpful for the vehicle to move off after coming to a standstill and then initiate an MRM to bring the vehicle back to a standstill. A simple optical warning should be sufficient for the driver to resume control.

Germany – it does not state that the vehicle has to accelerate after coming to a standstill, it is up to the manufacturer what they do in that situation during a transition demand.

INDUSTRY – if the vehicle moves off again after standstill, the following traffic will assume that the vehicle is in normal operation before then doing an MRM.

Chair – the transition demand is purely there to give the driver a chance to takeover control. Should we switch on hazards when the vehicle comes to a standstill when the driver has not taken back control?

INDUSTRY – perhaps we could say that the hazards will activate after 4 seconds of standstill.

Chair – risk is that we have different systems on the market. One stays in standstill, another continues to operate. The driver should have the full 10 seconds to takeover and then the MRM is the last option.

INDUSTRY – suggest a clarification in 2.7.2. that the vehicle may remain at a standstill and will put on the hazard warning lights after 4 seconds. Can continue requesting the driver to takeover.

UK – there are different scenarios whereby a transition demand can be issued and the response may need to be different. May need to add clarification as to what happens when the vehicle comes to standstill in terms of alerting the driver and indicating to them that they are now in control.

Chair – I believe that you can only override the vehicle with the brake, not with the accelerator.

UK – text allows you to override with the accelerator, but you cannot go beyond the set speed of the system.

Chair – coming to a standstill is a failure condition, so should regulate this specific case separately.

UK – believe the text needs to be broken down to address expected event, unexpected, and failure condition, as well as the general requirements.

Japan – driver should recognise the situation to take back control quicker if the vehicle has come to a standstill and the sees the other traffic moving off. The driver may take longer to takeover if the vehicle continues operating.

INDUSTRY – only see a need to differentiate between the three different cases in terms of timing for issuing the transition demand.

Germany – is the problem that you cannot detect when the driver has taken over control when the vehicle is at a standstill?

Chair – do not understand why we need to wait 4 seconds for the hazards if the vehicle comes to a standstill once a transition demand has been issued. Also, haptic is the best warning to bring the driver back into the loop.

INDUSTRY – concern that starting the hazards immediately could look strange to the surrounding traffic, particularly if the transition demand has not been issued for very long. Requiring haptic at standstill could be technology restrictive, as you cannot use brake jerks.

UK – we are discussing a normal driving situation where the driver may have adapted their behaviour to take back control during the transition period. There is an additional stimulus of the vehicle coming to halt and the rest of the traffic moving away. If we allow the vehicle to move off and then go through an MRM, you end up in the same situation, except you have an additional risk of having accelerated and then decelerated.

EC – but if the driver is not sleeping or anything, why would they have not taken back control?

UK – they have become used to having 10 seconds to take back control.

EC – support Germany that the vehicle can decide the safest thing to do (stay at standstill or move off).

UK – agree that we need to give a request to the driver to resume control at a standstill, but we should have one procedure rather than letting the vehicle decide to ensure consistency. Support industry position that applying the hazards should be the same approach as under MRM. Haptic signal is not design restrictive.

INDUSTRY – should the regular transition demand continue after the vehicle has come to a standstill? What is the decision with regards to the hazard warning lights?

Chair – what happens when the transition demand is deactivated?

INDUSTRY – the intent is that when the vehicle comes to standstill, the system does not continue to operate at all (no partial system). However, the request to takeover will remain.

Chair – if the function stops at standstill, then does the vehicle start to move forward (as the driver is not pressing the brake and it is an auto transmission)?

NL – the system should continue for those 10 seconds (transition demand) even if the vehicle is at standstill (e.g. continues to hold the vehicle at standstill).

INDUSTRY – if the transition demand continues when the vehicle is at standstill, then the system is still active.

UK – 2.7.6. mentions that the system deactivates after the transition phase. Do we have black hole after this period, as the system will not do anything to hold the vehicle stationary and also the driver has not taken over?

INDUSTRY – we could supplement that MRM to state that it will keep the vehicle at standstill. Also need to then think about defining taking back manual control. Need a general requirement to keep the vehicle stationary, but should not be considered as part of the system being active (consider the responsibility of the automated system).

Chair – hazards will not be applied until 4 seconds after the MRM, which comes after the full transition period. Could be a total of 13 seconds at standstill without the hazards.

INDUSTRY – proposal for 2.7.2. guarantees hazards are displayed after standstill for 4 seconds. MRM starts earliest 10 seconds after the start of the transition phase, so can delay that whilst keeping the vehicle at standstill. Activation and deactivation is handled in 2.4., so need to consider amendments there.

Chair – what are the requirements for the driver to take back manual control?

INDUSTRY – this is situation dependent. For example, in standstill, it should be sufficient for the driver to press the brake and then the driver is informed that they are back in control. Taking manual control still needs to be defined.

Chair – can the driver use the pedals without the steering wheel to take back control?

INDUSTRY – at standstill, yes, it is enough to just press the brake. During driving, the driver should need to take hold of the steering wheel.

INDUSTRY – we need to consider what happens if the driver operates a pedal without holding the steering wheel, and also if they hold the steering wheel without feet on any pedals.

Chair – there is a difference between overriding (e.g. temporary increase of speed) and taking over manual control.

UK – from a legal point of view, we need to be careful to understand who or what is in control of the vehicle at any point. I am not sure how we can achieve that here today if there are differences of opinion.

Chair – propose an extended lunch break for industry to share the situations for taking over manual control.

INDUSTRY – will share thoughts on manual takeover following the next break.

Discussion on information to the driver (para 2.8.)

Chair – information to the driver during emergency manoeuvre is missing.

INDUSTRY – question the need to inform the driver during an emergency manoeuvre, as this will occur when the driver does not have time to react. The emergency manoeuvre itself will serve as an indication to the driver that something is happening.

Japan – there should be information to the driver during the MRM that the vehicle is coming to standstill.

INDUSTRY – this could be done through an optical warning, but is it required to regulate this given that the vehicle will be slowing down?

Japan – optical information is enough, but it is important to tell the driver that the vehicle will be stopped.

INDUSTRY – the driver still has a chance to take back control during MRM, so may be confusing if we tell them that the vehicle is coming to a stop.

Canada – failure should be acoustic as well as optical. A warning that an emergency manoeuvre is ongoing would be useful to the driver so that they are aware of what the vehicle is doing (and know that it is not a malfunction).

UK – will vehicles equipped with the system also have a B1?

INDUSTRY – it is possible to have both, such as allowing a B1 for higher speeds above which the automated lane keeping function can operate.

Chair – I believe the proposal in 20-04 is much clearer.

UK – the key difference in 20-04 is the use of the symbol. I find it difficult to see how we can have a vehicle with two different symbols requesting the driver to put their hands back on the steering wheel.

INDUSTRY – HMI for a level 3 should be more elaborate than a level 2. For example, some concept vehicles have lights in the steering wheel. There are better ways to display the request to the driver rather than the B1 symbol.

Chair – manufacturers will all come up with a different solution. The proposal in 20-04 ensures there is at least one symbol that is consistent across all vehicles.

UK – B1 does not demand the text box, only the symbol and the colour coding.

INDUSTRY – most concepts in industry are very similar (lights in the steering wheel), so we have some form of standardisation. We want the driver to have their eyes on the road, so do not believe this symbol is helpful.

Chair – we want to ensure there is some consistency for all vehicles. There is nothing to prevent you providing additional information.

INDUSTRY – we can agree to put the symbol as long as we are not prohibited for providing additional information. Industry will provide an updated proposal for tomorrow morning.

Sweden – isn't the case different for B1 where we want to the driver to takeover because a certain time has elapsed. Here, we want the driver to takeover because there is imminent danger. The symbol should be very simple so they have time to look outside the window.

Chair – the symbol only indicates that the driver should takeover manual steering. The warning strategy is different, as it may be accompanied by haptic and/or acoustic signals.

INDUSTRY – might have mode confusion if we use the same symbol as B1 to indicate the system is active. Can support using the same symbol for takeover request.

Chair – mode confusion is only if you have B1 and B2 in the same vehicles.

INDUSTRY – you could also have mode confusion if you use the same active symbol and go from a vehicle with B1 to one with B2.

Chair – we can use a different symbol to denote active for B2. For headlamps, you have the same symbol with an A for an automatic symbol. Can we use the same logic here, so have a steering wheel symbol with an A?

INDUSTRY – do not see the need for tell-tales, as with such a system, we will have a completely different cluster display.

Chair – we are ensuring a minimum set of requirements, but manufacturers are free to do more if they wish.

INDUSTRY – in B1 there is nothing defined on how we show the system is active.

UK – there should be a distinction between displaying that the system is active and requesting the driver to takeover. Relaxed about the system active indication, as the driver will learn this when they activate the system. We may be able to revisit this in 5 / 10 years' time, but we should

continue with the B1 symbol for the takeover request. No problem with supplementary information. In most cases, there is sufficient time for the driver to look into the instrument cluster before taking control.

INDUSTRY – we can agree with the UK to use the B1 symbol for a takeover request. Propose that the symbol is shown in red for MRM. Moving hands symbol is distracting, so we don't support that. New text to be available on the website tomorrow.

Sweden – question to UK; if we are used to this symbol when there is no real danger, should we not use a different symbol for when there is real danger?

Chair – there is no real danger as the vehicle can handle the situation during the transition demand, we just want to indicate to the driver to takeover.

UK – agree with the Chair, this symbol is used during a transition demand without imminent danger. The latter needs to be considered separately.

Chair – suggest everyone reviews the text overnight and revisit in the morning.

MRM (para 2.9.)

Germany – the higher deceleration values for haptic brake jerks should only be under the transition phase and not the MRM. Concern that this is written in the MRM because it will be a common occurrence.

INDUSTRY – agree that it will be a rare occurrence. Can agree to strike out the brake jerks and move that into the transition phase.

UK – what do we mean by a "maximum deceleration" in terms of assessment? Will this be MFDD and how will it be measured? We should be specific about brake jerks, because this will have little impact on an average deceleration reading.

INDUSTRY – we had in mind peak deceleration, but we can handle in the test section how we check that the peak does not exceed the limit set.

Japan – what is meant by "very short"? A specific value is required for testing / approval.

UK – need to be conscious that the average can be much lower than the peak.

INDUSTRY – suggest using the approach of AEBS where we use "brake demand" from the system.

Japan – what happens with deceleration in the case of "severe system failure"?

INDUSTRY – aim is to bring the vehicle to a stop as soon as possible in the event of a severe system failure. Should be no limit for how long a higher deceleration can be requested. Can consider requiring emergency brake lights or hazard lights for a severe system failure.

Canada – can we add a minimum value for the deceleration?

Germany – there is also no maximum time duration for the MRM.

Canada – MRM (stopping in lane) is failure mitigation. Minimal risk could be continuing until a point where safe harbour is possible.

INDUSTRY – a longer time also gives the driver more time to resume manual control.

Germany – why not extend the transition phase if you want to give the driver longer to resume control? The purpose of the MRM is to bring the vehicle to a standstill.

INDUSTRY – see no problem with the vehicle continuing to operate and searching for safe harbour if the MRM has commenced due to the driver being detect as being unavailable.

Japan – believe in the second paragraph, it should be "may" perform lane changes.

INDUSTRY – it should be a "shall".

Chair – does this include crossing into the hard shoulder? If not, why shouldn't this be possible?

INDUSTRY – don't see the need to monitor the rear if moving into the hard shoulder as vehicles should not be overtaking here.

Chair – if you have a breakdown and call for assistance, they use the hard shoulder.

INDUSTRY – vehicles using the hard shoulder should be very aware of vehicles moving in for an emergency.

Chair – suggest instead stating that if the vehicle is equipped with rear and side sensors, it will change lane if the situation is uncritical.

INDUSTRY – do not support, as a lane change is not always the safest option.

Chair – the safest positon is always the hard shoulder, so if the vehicle is equipped with the necessary sensors, it shall move to the hard shoulder.

INDUSTRY – evaluating whether or not to use a shoulder and how far you should move into the hard shoulder is difficult. What about if you are equipped with rear and side sensors but you have a failure? Need to consider the language.

Chair – what about limiting the function to the lane closest to the hard shoulder if it is not equipped with means for a lane change?

INDUSTRY – what happens if you do not find an uncritical situation to allow you to change lanes? Would it be allowed to bring the vehicle to a standstill in the fast lane? Don't see the risk of bringing the vehicle to a standstill in a traffic jam.

Chair – how can a technical service grant type approval if it doesn't always move to the hard shoulder?

INDUSTRY – copy the provisions from ACSF category C.

INDUSTRY – the intention is to have the flexibility to allow ALKS technologies with or without lane change function.

INDUSTRY – unsure under what circumstances we are required to do a lane change. Also should only have the vehicle coming to standstill in rare cases as the 10 seconds for transition demand should be sufficient to get the driver back in the loop.

EC – lane change capabilities should be covered in another regulation and keep this regulation for ALKS.

UK – vehicles with automated systems will be approved to a new regulation and cannot then be approved to another regulation.

EC – suggestion is to keep to just writing the requirements for ALKS and not do the requirements for lane change at this stage.

Germany – removing this requirement means that the vehicle will always come to standstill in the lane, even if it is fitted with the capability to perform a lane change.

INDUSTRY – there is still a difference between saying it shall perform a lane change or allowing the system to determine what is the best course of action.

Chair – the priority should be to carry out the lane change if possible. If we allow the vehicle to come to standstill anyway, then all manufacturers will do this as it is the easiest thing to do.

INDUSTRY – if traffic is too dense, you will not be able to undertake a lane change.

UK – can we reach an understanding on whether it is right to put this into the regulation? From R79, we believe that the technology exists for a vehicle to be able to safely undertake a lane change manoeuvre. Can we add this in on an "if fitted" basis if we determine the scenarios under which a lane change will occur?

INDUSTRY – of course the vehicle will undertake a lane change manoeuvre if it is the minimal risk condition. If there is traffic in all other lanes, it is the minimal risk to change lanes or should you stay in the current lane? We need to be careful about the language.

UK – even for the situation described by INDUSTRY, the vehicle still has the capability to perform a lane change once it determines it is safe to do so. The ultimate objective is to put the vehicle in a place of safety, provided it doesn't create a safety risk in doing so. I believe the provisions in ACSF Cat C are sufficient.

INDUSTRY – the current wording does not allow a critical lane change, but there are still situations where it may not be possible.

UK – at least we agree in principle. Is this something we can work on outside of the meeting?

Chair – why do we allow the system to operate in the fastest lane? In this case, the driver should operate the vehicle manually.

INDUSTRY – the system can operate in the fast lane as it has the capability to make lane change manoeuvres.

Canada – there are instances where it may be safer to pull over into a shoulder next to the fast lane.

INDUSTRY – we discussed about classes yesterday. Perhaps this is a topic where the requirements are different and so we can live with having a stop in lane for lower speeds.

UK – we could come at it the other way and say that we are introducing a requirement for a low speed system so we can learn in a relatively safe environment. Also, a traffic jam can be temporary, so a low speed situation could quickly develop into a higher speed situation.

INDUSTRY – stopping in lane shouldn't occur very often as normally the driver should take back control unless there is a medical emergency.

Canada – you can sometimes get a traffic jam on the "fast" side of the highway with faster flower traffic on the other side that you may not be able to pull out into (e.g. split in highways).

NL – we already discussed the situation of medical emergencies. Perhaps we are putting a lot of work into a situation that should be very rare. There are some difficulties with the vehicle changing lane. It would be simpler to say that the vehicle just comes to a standstill in the lane.

INDUSTRY – in response to UK comment about learning with these systems, if we leave it open as an option, some manufacturers will equip the systems for their own learning. Also, slow speed traffic can also cause problems with making a lane change.

Japan – "critical situation" also needs to consider vehicles alongside or in front of the vehicle. Otherwise, the manufacturer should be required to declare the critical situations.

INDUSTRY – it was a simple omission on vehicles driving alongside.

EC – support the view of INDUSTRY that lane change should be only one possibility.

Germany – can INDUSTRY also consider about how long the vehicle will consider making a lane change.

Emergency manoeuvre (para 2.10.)

Chair – there are only expected or unexpected events.

Canada – suggest removing from "imminent danger" definition the reference to expected or unexpected events.

Chair – is it necessary to discuss an emergency manoeuvre for TJP?

INDUSTRY – yes, believe it is necessary. For example, following a vehicle that then performs a full brake or if a vehicle cuts-in, the MRM is not sufficient to avoid a collision (limited deceleration rate).

Chair – I don't see any situations where an emergency manoeuvre is necessary.

Canada – the current text doesn't cover normal driving situations, such as the vehicle in front slowing down, when you should adapt your speed.

Germany – is this a common situation?

INDUSTRY – it is not a common situation. For example, load falling off a vehicle into your lane. Some mitigation should be in place in normal driving to mitigate the risk of emergency situations, but they may still occur.

08/11/2018

ACSF-20-07 - (OICA – CLEPA)

Industry presented a proposal on the definition for the driver taking over manual control:

- The driver deactivates the function.
- The driver brakes to keep the vehicle stationary.
- The driver provides an input to the steering control [and additionally to brake, accelerator or clutch control] when the vehicle is moving.

INDUSTRY – need to consider what the definition is used for; is that one of these deactivates the function, or that one of these is considered as a takeover during a transition demand?

Germany – in response, will we have two definitions?

INDUSTRY – the current list is valid for all situations, but there are further items that may not always be appropriate. For example, the driver puts their hands on the steering wheel, this could be a takeover if it is during a transition demand. However, if it is during system operation, it may not be takeover.

UK – we still need a way to distinguish whether an input is an intention to takeover. A second input could be a way to confirm.

Chair – also need to consider what happens when the accelerator only is pressed.

INDUSTRY – that depends on the system design.

Chair – for me, you need to two means to takeover, so hands on the steering wheel as well as pressing the accelerator.

INDUSTRY – our proposal to handle this situation is covered in para 2.4.7.B in 20-04.

Japan – takeover during a transition demand and driver override should be separated.

UK/INDUSTRY – concern raised that we keep postponing making key decisions.

INDUSTRY – we need to first agree on the principles before we can make progress.

INDUSTRY – suggest having some clear tasks for some smaller subgroups to deliver the work back to the main group.

Chair – we have documents 20-04 and 20-06. Have a clear CP position on the indication to the driver, but we still spent 3-4 hours discussing this as industry want freedom to do their own thing. Also have a common position on the MRM (standstill in lane or safe harbour if fitted with a lane change function). We constantly receive new proposals that don't fit with the principles agreed in the group. Open to having a small group to draft proposed text. We can note down the principles we have agreed on to assist the drafting group.

UK – we need to make progress from 19th November to 14th December in terms of any further discussions. Happy to host a small drafting group (Germany, Japan & UK) in London early in the

window to then distribute documents. There would then only be square bracket items to be discussed at the next ACSF meeting.

INDUSTRY – agree with the Chair that we have made a number of decisions at this meeting and there are some items in square brackets that are not that difficult to solve by the next meeting. We should write down the principles we have agreed to support a drafting group. The document 20-04 highlights the points where there is disagreement between industry and the Germany proposal. We should focus on discussing these points.

Japan – is it possible to change lane as part of the emergency manoeuvre?

INDUSTRY – yes, the text has been drafted to allow this if the vehicle is equipped with sensors to check the adjacent lanes.

Japan – how is the vehicle able to check that the adjacent lane is clear during an emergency manoeuvre?

Chair – this is the same discussion as under MRM that we allow a lane change if the vehicle is fitted with a technology to ensure it can be done safely.

INDUSTRY – can clarify "unless the vehicle is equipped with sensors capable of detecting" for allowing an evasive manoeuvre into another lane.

UK – no issue with the principle, but concern about completing this in the timeframe, particularly thinking about how the technology can be assessed. This is a dynamic situation with a vehicle changing lane, possibly quite violently. The text should be in square brackets as something we wish to deliver, but does not slow down progress. CPs need to consider how we determine which vehicles have which features, given vehicles approved to this regulation will have slightly different capabilities.

INDUSTRY – if we prevent an emergency manoeuvre from crossing the lane, we could cause the vehicle to stop in lane where the majority of human drivers would normally cross the lane by a small amount to avoid the object.

UK – not opposed to allowing such an option, but we spent three meetings on ACSF Cat C discussing crossing a lane. It is optimistic to develop the necessary text in time.

INDUSTRY – we can volunteer to draft some text and you can then make a decision on whether or not include it.

Japan – if industry want to put in some text, a specific test procedure is also necessary.

Germany – what is meant by the word "terminated" in the draft text? Is the emergency manoeuvre ended, but the system is still operational? Also, at a standstill, should we not be asking for a transition demand?

INDUSTRY – whether or not the system deactivates is scenario dependent. For example, you may only need a very short period of harsh braking. Do not see a need to deactivate the system unless the vehicle has come to a standstill.

Germany – can agree with the principle, but perhaps the wording needs to be adjusted.

Japan – a transition demand is necessary before the system is deactivated after coming to standstill.

INDUSTRY – we can look to clarify the wording that the vehicle will be held stationary until the driver has taken over manual control.

ACSF-20-12 (Canada)

SAE J3016 (available freely on the SAE website).

Promote the use of automated and avoid using autonomous.

Chair – what is the difference for ALKS if we apply MRM and failure mitigation?

Canada – at a minimum, all systems have to be able to stop in lane (failure mitigation). Minimal risk covers allowing other alternatives if the system is capable (e.g. safe harbour), but this will be dependent on the situation.

UK – the difference in expressions are deliberate. SAE expressions change, and we can't have regulation based on terms that may change. Further, we do not want engineers reading the regulation and applying our definitions to their understanding based on other sources (e.g. SAE).

ACSF-20-14 (UK)

UK – use the term "visualisation system" to be technology neutral. Suggest vision of three lanes to cover curvature in the road. For lower deterioration factors, the manufacturer must provide evidence, which will be available to other CPs to review if requested. Normal life figures are based on those used in environmental regulations, but this may need to be different for a safety system.

INDUSTRY – can agree in principle. This is linked to radar technology; you may not have any deterioration for camera-based systems.

UK – the intention is to be as flexible as possible. It is likely that there will be a number of sensors used to cover the field-of-view. You will have a discussion with the Technical Service as to what deterioration factors you are guaranteeing.

INDUSTRY – can we allow a third option for systems that are able to self-monitoring to continually assess the capability of its sensors?

UK – ACSF Cat C discussion suggested that the industry was not ready to do self-monitoring. However, we are open to looking at how this can be incorporated into the text. Likely to still need installation information included, as this can change over the life of the vehicle.

Canada – what will happen when the vehicle exceeds the defined "normal life"? Distance is likely to be higher in North America. What would happen if there is a software update that actually improves the detection range?

INDUSTRY – should not necessarily follow the approach of ACSF Cat C. Don't agree with an extension to type approval if, for example, the paint is changed. Propose a self-monitoring approach.

INDUSTRY – suppliers do environmental and lifetime tests. Can this be taken into account?

UK – that is exactly what is intended in the proposal, so this would be the evidence that can be used to justify lower values.

INDUSTRY – can we use the CEL demonstration as part of this justification?

UK – they are two separate things. The integrity of the system will form part of the CEL assessment. The range capability would not be part of this assessment.

Sweden – emission systems have to be guaranteed after the approval. Will there be something here, or will it just be the manufacturer's declaration?

UK – previously not seen any information on the robustness of sensors. As the driver will be taken out of the loop, we have to be certain of how the system will perform in the market during its life. In Europe, there will be a form of market surveillance. There needs to be some form of action we can take to restore systems to good health if we see any issues in the market. The current proposal can be used for the first phase, but we can look to create something more

intelligent in the next phase to cover self-monitoring. The proposal is not intended for PTI, but can be checked as part of market surveillance.

INDUSTRY – does the environmental factor need to be applied all the time, or only during certain conditions? Speed needs to be adapted based on the environment, both for the vehicle capability and also the sensor performance.

UK – my intention is not to reduce performance, I am looking for industry to share their system information. This can be done on a confidential basis with the Technical Service. We are supportive of finding a way to accommodate speed adaption based on the environmental conditions in the text.

INDUSTRY – there are already lifetime validation tests for the sensors. Is this sufficient to not involve the deterioration rate?

UK - Needs an evidence for Technical Service, then another value for deterioration rate is possible.

CITA - Important to clarify, how to evaluate at PTI e.g. a second layer, aftermarket or repair of the sensors.

INDUSTRY – System will have a self-diagnostic, if it can fulfil the requirements and can operate. If there are two independent sensors, which can replace each other, there is a possibility that there is at least one which fulfils the whole range. So there should be no decrease rate for the sensor.

CITA – there are other parameters that affected the performance over the lifetime, such as repairs following an accident.

INDUSTRY – the UK proposal is similar to the approach of ACSF Cat C, but goes a bit further in terms of what needs to be declared. This is not necessary with self-monitoring. There are many ways to do plausibility checks, especially if there are multiple sensors that can compare inputs.

UK - Open for another approach which includes the default factors.

INDUSTRY – clarification on documents for in-service compliance / market surveillance; what is the intention?

UK – the intention is that the process and procedure for determining the manufacturer's deterioration factors could be replicated to check those values.

INDUSTRY – what are the conclusions on the self-monitoring approach, which could directly replace what is in 20-14?

NL – it is a good approach to have one process for all vehicles, and support having continuous self-monitoring.

UK – I look forward to a proposal for self-monitoring as an alternative. Just proposing self-monitoring could be design restrictive.

INDUSTRY – industry will develop a proposal and can work with the UK.

Canada – your detection range varies based on the road geometry (e.g. dips in the road, going around a curve).

UK – you are correct, Canada. The scenario exist anyway and road design considers sight stopping distances.

INDUSTRY – the vehicle has to adapt its speed to the infrastructure. Should not set performance requirements for road geometries where it is clear you would not be able to see as far.

ACSF-20-05 (OICA-CLEPA)

INDUSTRY – we should define the transition procedure, but not the scenarios under which a transition is required. Industry is incentivised to minimize these scenarios as customer acceptance would be poor if the system continually asks for a transition.

NL – map data is quite often mentioned, but R79 notes that map data shall not be used to steer the vehicle.

INDUSTRY – the map data is used for confirmation and to bridge gaps you may have with the optical sensors.

NL – how is the vehicle steered during those sensor gaps?

INDUSTRY – you correlate what is being seen by the sensors to the map data first to confirm the map data. If there are gaps with the sensor, then you can use the map data to fill in the gaps.

EC – other than driver availability, a transition demand will only be issued based on the manufacturer's strategy?

INDUSTRY – a transition demand must be demanded if there is a system failure.

ACSF-20-08 (ROK)

Japan – where does the 0.8 second gap at 0 km/h come from?

Germany – ROK provided a table with distances, but do you also have one for the time gaps? Do you also a table with a moderate deceleration rate rather than 9m/s/s?

ROK – normal peak of braking is 9m/s/s.

INDUSTRY – a fixed time gap may unnecessary for low speeds. In principle welcome the idea to have a dynamic gap.

UK – how can we consider a safety gap based on 140% of the deceleration rate required by regulation (6.43m/s/s from R13-H)? The rate required by regulation is also only for a high adhesion surface.

Chair – there is no objection to the approach, by the exact numbers still need to be agreed.

EC – should there be any requirement for a safety distance to the side of rear?

ROK – this is a lane keeping function, so do not need to consider side and rear safety distances. We will recalculate the gap based on a more achievable deceleration rate.

INDUSTRY – the values calculated here assume the vehicle in front instantaneously comes to a standstill. Offer to further develop the equation in 20-04 based on the work from ROK and the comment from UK.

ACSF-20-04

Safety distance (para 2.5.6.)

INDUSTRY – there are no requirements on a conventional driver to adapt the gap to the side or rear. The correct reaction would also be difficult to define.

ACSF-20-16 (Secretary)

Germany shared principles to agree in order for the group to make progress.

NL – do we consider seat / steering position under driver presence or driver awareness?

Chair – this is part of the driver awareness.

INDUSTRY – suggest “brake jerks” can be defined as a form of haptic warning rather than being listed under the transition demand.

INDUSTRY – need to consider where the emergency manoeuvre interrupts a transition demand, does the transition demand resume if the emergency manoeuvre ends.

Japan – query why the system has to deactivate once the vehicle comes to a standstill following an EM if the traffic situation then improves.

INDUSTRY – the deactivation should be linked to if the EM occurs whilst there is a transition demand. If there is no transition demand and an EM brings the vehicle to a stop, the system may continue.

ROK – what is the criteria for defining an emergency situation? I have seen the 3.7m/s/s deceleration used before.

INDUSTRY – could avoid an imminent collision with just an evasive manoeuvre without any braking. The definitions help to define the situations for an EM.

Canada – you may be able to achieve better than 3.7m/s/s braking, but it is dependent on the road conditions (e.g. ice or oil that you can’t detect in advance).

INDUSTRY – how are we going to proceed with revisiting the value used to calculate the safety distance? What about the 3.7 m/s2 value?

Germany - Possible to reconsider this value.

ACSF-20-04

Headway control (para 2.5.7.)

Presentation ACSF-20-08 “Minimum Safety Distance to the front” by ROK

INDUSTRY – Industry welcomes the proposal. No fixed time gap.

UK - How to calculate with a value of 140% of that, what is stated in the Reg. 13H? Because of that, UK cannot support the proposal.

INDUSTRY – Industry will draft a text including the idea of the presentation.

NL – it should be guaranteed to avoid a collision with an object, not just a vehicle.

INDUSTRY – this comes under the EM, as an object could be a plastic bag or small animal for which you are not allowed to brake.

UK – the replacement text does not say that the vehicle shall be bought to a halt any more. Should also be to come to a stop behind (not in front) of a stationary vehicle.

Maximum operational speed (para 2.5.10.)

INDUSTRY – can work with the UK to incorporate their concerns raised in 20-14. Also, system delay of 0.5 seconds is a lot longer than is required to reach 3.7m/s/s.

UK – although not discussed, there is a lot in the UK document addressing headway control. UK, Germany and Japan will prepare an initial draft consolidating what has been agreed here. This will then be circulated to try and get an agreed document with industry. Aim to have the initial draft completed by 26th November.

Germany – can industry further work on the test procedures whilst the drafting work is ongoing.

INDUSTRY – the tests do need to be updated, but need to consider tests for the most important requirements. May be able to circulate a document with some updates, including issues such as test condition, etc.

UK – the ambition is to take an informal document to GRVA in January, which therefore cannot be adopted (as it is an informal). We are looking to get a document without square brackets or ones that can be resolved in GRVA. There can then be a formal document ready for adoption at the end of GRVA. We will have between January and September to define the tests.

INDUSTRY – we should at least try to provide a complete list of the tests we want to GRVA with basic principles (e.g. cutting-in vehicles).

INDUSTRY – we still have some conflicts with previous proposals, which have not been agreed (e.g. the principle of classes, the overriding strategy, deactivation and/or reactivation after overriding).

UK – we will have to leave square brackets around text where there is not yet agreement on the principles.

INDUSTRY – what is happening with PTI and data recording?

UK – data recorders rests with GRVA. It needs a new group with specific expertise created under GRVA.

ACSF-20-09 (ROK)

ROK briefly presented the conclusions of their document. There are some videos to show studies they have done on vehicle response in an emergency situation. This can be used as guidelines for developing the test procedures.

ACSF-20-10 - (EC)

The EC prepared comments on Informal Document - ACSF-20-04 “Consolidated version - proposal for technical requirements of an ALKS-EC”. The document has not been discussed during the 20th

ACSF-20-17 - (Republic of Korea)

ROK made a study “comparison of warning effectiveness”. The presentation was delivered after the end of the 20th ACSF session.

List of revised Documents at the end of the 20th session of the IWG on ACSF:

ACSF-20-03r1 - (Chair) agenda 20th session
ACSF-20-04r1 - (Secretary) consolidated version - proposal for technical requirements of an ALKS
ACSF-20-06r1 - (OICA-CLEPA) industry proposal - Chapters 2_6 until 2_10_Oct-30-2018
ACSF-20-07r1 - (OICA-CLEPA) Industry proposals - Definitions

5. Other business

6. List of action items

UK - J, UK and D will draft a consolidated document, which will be circulated before Christmas.
Germany - Industry should draft the tests. Tests headings defined from industry are not confirmed by CPs.

UK - Informal Document for GRVA, no possibility to adopt. Square brackets should be removed during GRVA. For the September 2019 session, there should be a Formal Document. Tests should be agreed after GRVA 02. Main input for GRVA should be the requirements. Possible time schedule: March 2020 WP29, into force end of 2020.
INDUSTRY – Further discussion needed on limitation on 60 km/h and some other options. Not easily solved.
UK - Small drafting group will mention different options. If there is no agreement, industry can comment on the draft.
INDUSTRY – What about DSSAD, PTI, CS?
UK - Maybe a group at GRVA for Data Management (discussion at WP29). So concentration on low speed systems without necessary DSSAS?

7. Schedule for further meetings

21. ACSF IWG Meeting: t.b.d. (week of January 14th, 2019 / before 2. UNECE GRVA)

Venue: China, will be confirmed asap