

## **DRAFT REPORT**

### **9<sup>th</sup> meeting of the GRRF informal group on Advanced Emergency Braking and Lane Departure Warning Systems**

Venue: TOYOTA Motor Corporation Tokyo Head Office  
1-4-18 Koraku, Bunkyo-ku, Tokyo 112-8701  
16th floor, Main meeting room

Chairman: Mr. Johan Renders (EC) ([johan.renders@ec.europa.eu](mailto:johan.renders@ec.europa.eu))  
Secretariat: Mr. Olivier Fontaine (OICA) ([ofontaine@oica.net](mailto:ofontaine@oica.net))

#### **1. Welcome and Introduction**

#### **2. Approval of the agenda**

Document: AEBS/LDWS-09-03 (Chair)

The agenda was approved with no modification

#### **3. Outcome of the 7<sup>th</sup> and 8<sup>th</sup> meeting of the AEBS/LDWS IG**

Document: AEBS/LDWS-08-01 (draft minutes)

The Chair orally reported about the outcomes of the 7<sup>th</sup> meeting of the informal group, held in London on 15-17 September 2010, and the 8<sup>th</sup> meeting, held in Geneva on 20 September, in the margin of the 68<sup>th</sup> session of GRF.

Concerning LDWS, the Chair was happy to remind that the informal group achieved consensus on a consolidated and stable document.

Concerning AEBS, the Chair recalled that the informal group held lengthy and extensive discussions due to some divergence about the set of criteria. He reminded that after the 7<sup>th</sup> meeting, the informal group decided to recommend establishing the performance requirements in two separate regulatory texts, devoted respectively to AEBS reacting to moving targets and to stationary target. The group was also to request guidance about the regulatory approach for those two separate texts, i.e. whether two new regulations would be established from scratch, or whether AEBS reacting to stationary target would be introduced into UNECE R13 and AEBS reacting to moving target introduced in a brand new regulation. The discussions at GRRF however led to the decision to devote one Regulation to collision avoidance and one to collision mitigation. This for providing each Contracting Party the necessary flexibility about application of the regulation in their national territory.

#### **4. Outcome of the discussions in GRRF68**

Document: Regulatory approach presented to GRRF68

GRRF agreed on the establishment of two Regulations on AEBS: one addressing collision mitigation and the other addressing collision avoidance.

Concerning LDWS: some comments aroused about the testing procedure. The original proposal was to test the vehicle according to the markings of one Contracting Party with in addition providing data from the vehicle manufacturer to supplement about the other markings as set up in the relevant annex of the Regulation. OICA was keen to simplify the approach, making a simple reference to the marking as set out in annex 3, irrespective on whether the CP applies the Regulation or not.

Concerning AEBS, Germany requested to reverse back to a proposal suggested at the GRRF session to draft one Regulation on moving and one on stationary targets. The delegate from Germany raised the concern that having two different regulations may not respect the spirit of the 58 Agreement for a worldwide harmonization and mutual recognition of the type approvals.

The Chair then requested the parties present to confirm their understanding of the outcomes of the 68<sup>th</sup> session of GRRF, i.e. devoting one Regulation to collision avoidance and one to collision mitigation. All the parties present in the meeting confirmed this understanding of the GRRF decision.

Concerning the relevancy of the decision taken by GRRF, the Chair, as representative of the European Commission, pointed out that the European Commission considers that the decision made at GRRF must be respected as it respects the necessity of mutual recognition. He stressed that the informal group is hence committed to follow the route shown by GRRF. The Chair concluded by recommending Germany to address their concern at the 69<sup>th</sup> session of GRRF (February 2011).

## **5. LDWS draft regulatory proposal:**

Feedback from discussions in GRRF68

Documents: ECE/TRANS/WP.29/GRRF/2010/29/Rev.1

All the parties present were in agreement with the amendments proposed by GRRF.

UK, J, S and D committed to communicate ASAP the relevant lane marking outlines of their respective territory.

The informal group was informed that a revision of the draft regulation for LDWS will be tabled at the 69<sup>th</sup> session of GRRF (February 2011), under the reference ECE/TRANS/WP.29/GRRF/2010/29/rev.1.

## **6. AEBS:**

### **6.1. Clarification of regulatory approach**

Documents: email sent on 21 October 2010 (OICA communication to GRRF informal group on AEBS)

OICA pointed out that the regulatory approach is a fundamental point deserving clarity. The representative of OICA recalled the context of the decision, while at the 7<sup>th</sup> meeting of the informal group, it was decided to recommend establishing the performance requirements in two separate regulatory texts, devoted respectively to AEBS reacting to moving targets and to

stationary target, GRRF at its 68<sup>th</sup> session suggested to establish one Regulation on collision mitigation and one on collision avoidance. It is on the principle point of view questionable to establish one regulation for suiting the wishes of Japan, and one for the European Union. As a matter of fact, such decision is contradictory to the spirit of the 58 Agreement which seeks global harmonization of the Regulations, while simultaneously being technically well aligned with the administrative provisions of the 58 Agreement because the solution does not prevent mutual recognition between Contracting Parties signatories to both Regulations. OICA pleaded for a solution capturing all performance requirements into one unique Regulation with a phase-in introduction of AEBS, whereby all Contracting Parties would commit to accept the latest level of amendments. The OICA spokesman announced that OICA has prepared a set of technical performance requirements as a consolidated OICA position, ready to be delivered under the condition that all Contracting Parties present at this session can support to accept an approach, as proposed by OICA, where all performance requirements are captured into one unique Regulation.

D, S and NL fully supported the OICA point of view.

CLEPA was of the opinion that the informal group should better acknowledge the failure in reaching one unique Regulation.

J recognized that the ideal situation would be to capture all requirements into one unique Regulation, but nevertheless found appropriate to accept the GRRF solution. The delegate recalled that the informal group concluded with a solution proposing to separate Regulations. While supporting the OICA point of view for what concerns its philosophy, Japan finds not appropriate to apply one regulation with two levels of severity, as underlined at GRRF-68 by the GRRF Chair and the UNECE Secretariat. The delegate of Japan added that the GRRF decision is similar to the case of approval of N1 vehicles with UNECE R13H/R13: the governments recognize that UNECE R13H compliance is valid also as UNECE R13 compliance.

The informal group acknowledged that both the necessity of establishing performance requirements addressing stationary obstacles and the need of capturing values for vehicles of categories M2/N2 are corner stones for achieving the objectives given to the group.

The Chair requested OICA clarification as to whether the three main parameters in stake are well covered in the OICA position, i.e. collision mitigation, collision avoidance and capturing relevant performance values for the four categories of vehicles as set up in the terms of references of the informal group.

The OICA delegate firstly clarified that the objective of OICA in sending the above mentioned Communication to the informal group was not to start again the elaboration of a draft Regulation from scratch, rather to harmonize the values for performance. He specified that the OICA proposal for a phased in introduction of AEBS is valid only if all requirements are captured into one unique Regulation because the automotive Industry finds benefits in this rulemaking mainly in mutual recognition and harmonized requirements. If there are two different regulation, there is absolutely no guarantee that mutual recognition will be sustained in the future. He then warned about the possible semantic misleading of talking about collision avoidance vs. collision mitigation as both wordings cover in reality the same system. Additionally, both wording also cover moving target and stationary target tests. As to whether the OICA position covers the third parameter mentioned by the Chair, i.e. the four categories of vehicles as set up in the terms of references of the informal group, the OICA spokesman explained that it is extremely difficult for the vehicle manufacturers to provide data about non existing vehicles.

The Chair made an attempt to summarize the evolution of the OICA position, and its difference compared to the decision of GRRF:

- The Chair found difficulty for Japan to apply collision mitigation only with the OICA approach
- The Chair found the OICA approach like applying the collision mitigation Regulation first, and the collision avoidance Regulation later. Hence the only difference between the OICA proposal and the GRRF decision would be the difference in timing. The Chair in addition considered that it would put pressure on the Contracting Parties wanting to apply the “basic” version of the Regulation
- The second difference is that the OICA proposal actually postpones the application of the amended regulation

The Chair also pointed out that the GRRF decision respects the principle of mutual recognition because J committed to recognize conformity with the collision avoidance Regulation as compliance with the collision mitigation Regulation. This was challenged by OICA, whose delegate pointed out that the two Regulations are already today widely diverging and that there is no tool within the 58 Agreement to guarantee alignment of two separate Regulations.

J confirmed their wish to keep the two Regulations harmonized.

D stressed that it is legally appropriate to elaborate one unique Regulation. The delegate from D also pointed out that the difference between collision mitigation and collision avoidance is only in the value we give to the test parameters, mainly the relative speed. In addition, he made clear that, contrary to what is written in the document AEBS/LDWS-04-08-Rev.2, Germany can accept lower performance in a first step for the moving target scenario, provided that the second step is clearly defined from the beginning.

NL warned the informal group that the wording can be misleading, because e.g. a system responding to the avoidance criteria would guarantee to be an avoidance system only in the perfect conditions. The delegate was of the opinion that the OICA approach was in line with the proposal made by the UK at the 6<sup>th</sup> meeting (Paris, 16-17 June 2010) in document AEBS/LDWS-06-10 for a staggered approach. NL would prefer the highest level of performance as from the beginning of the regulation application, but found better to mandate a robust system, with lower performance in the beginning, then require higher performance later. NL accept a 1<sup>st</sup> phase with low Delta V and a 2<sup>nd</sup> phase with higher Delta V, the time between the 2 steps depending on the technical requirements and the Industry capabilities in delivering robust systems. The delegate from NL mentioned a delay of about 2-3 years as reasonable.

S supported NL in that it is preferable to mandate a reliable mitigation system as a 1<sup>st</sup> step, with the perspective of a collision avoidance system in the longer term. The time between the steps depend on the required performances and could be a couple of years.

UK could not provide a opinion about the OICA approach as the UK preparation to the meeting was elaborated taking the decision of GRRF for the two Regulations Avoidance vs. Mitigation as a basis.

Conclusion:

- Varying degree of support to the OICA proposal
- OICA to make a decision on whether officially tabling the OICA position

Note of the Secretariat:

*OICA notified subsequently during the meeting that the OICA position would remain non official up to the end of the 9<sup>th</sup> meeting of the informal group.*

## **6.2. Report by the drafting groups**

Japan, as Chair of the drafting group of the Regulation for collision mitigation introduced the document AEBS/LDWS-09-01 as a compilation of the comments received about this skeleton paper.

Similarly, CLEPA, as Chair of the drafting group of the Regulation for collision avoidance introduced the document AEBS/LDWS-09-02 as a compilation of the comments received about this skeleton paper.

It was clarified that some comments introduced in one skeleton paper were to be applied to the other skeleton paper when relevant and to be indicated by their authors during the discussions.

J indicated their willingness to restrict the discussions to the performance requirements. The spokesman added that J was somewhat disappointed about the complexity of the collision avoidance draft Regulation, as in document AEBS/LDWS-09-02, after revision of by the drafting group, and recommended to reverse back to the document originally distributed by the informal group Secretary as a basic skeleton paper for consideration by the drafting groups.

### **6.2.1. Draft proposal for a Regulation for a Forward Collision Mitigation System (FCMS)**

Document: AEBS/LDWS-09-01

#### 6.2.1.1. Title of the Regulation

CLEPA challenged the wording of the title as proposed in the original text of the skeleton document, in particular the weakness of the reference to a system only “aiming” at collision mitigation. CLEPA found no point in proposing a Regulation which does not achieve its target and proposed simple and hopefully well understandable wording.

J challenged the CLEPA point of view because e.g. the avoidance cannot be reached in all circumstances, only in the case of the test conditions

UK supported the CLEPA proposal because “FCMS” could be confusing as it is already used in the relevant ISO Standard.

OICA was of the opinion that some definition of AEBS should be established in the draft Regulation. The group relied on the mini project group (see paragraph 6.2.1.3. below) to find a final solution to the title.

Conclusion: following the recommendation of the mini-project group, title to read “Regulation on uniform provisions concerning the approval of motor vehicles with regard to a collision mitigation emergency braking system”

#### 6.2.1.2. Scope

The experts held a debate about the product liability concerns which could be brought if the scope of the regulation does not mention the types of vehicle to which the system can react. On the one hand, mentioning them targets permit to limit the list of vehicles to which the system is expected to react, on the other hand, mentioning them indirectly implies a commitment that the system is able to react to all the vehicles cited.

Conclusion: specification of the expected targets remains in [ ]

### 6.2.1.3. Definitions

The majority of the experts challenged the introduction of a new definition of the system as FCMS (Forward Collision Mitigation System). S was of the opinion that the text should mention “rear collision”.

An mini-project group was formed under the chairmanship of NL to solve the issue of title, scope and definitions.

Definition of “moving target”: decision not to indicate the speed of the moving target definition.

Japan presented a proposal to adapt the definition of “emergency braking phase” to the vehicle category (see document AEBS/LDWS-09-06) because vehicles carrying passengers should be allowed to brake less than the good carrying vehicles. OICA found that the definition section is not the good place to address this issue. In addition, overreliance is related to the rate of false alerts. But limiting the performance is not the proper way to address the concern of overreliance. If there are few false alerts, the driver will rarely experience them and learn the AEBS functioning, and won’t “over rely” the system.

UK supported the opinion that overreliance should be addressed, but found the definition section the wrong place to do it.

D proposed to address this issue in an introductory section, similar to the one currently existing in UNECE R79.

#### Conclusions:

- General definition of AEBS
- Particular definition of AEBS-M addressing collision mitigation
- Particular definition of AEBS-A addressing collision avoidance
- Deletion of a definition of type-approval. The same deletion should apply as well in the draft Regulation on LDWS (document GRRF/2010/29/Rev.1)
- Moving target: no indication of the speed
- Soft target: CLEPA proposal adopted
- Concern of overreliance to be addressed not in the definitions section
- Germany committed to present at the 10<sup>th</sup> meeting a document, with relevant explanatory drawings, moving the value for a braking demand to a paragraph more relevant than the definition paragraph

### 6.2.1.4. Mandatory equipment of ABS/EVSC and reference to UNECE R13 (paragraph 5.1.1.)

The group held a debate about the opportunity to mandate equipment of an anti-lock system and/or a vehicle stability system in addition to the AEBS, and about the necessity to refer to the Regulation N°13.

OICA was of the opinion that the equipment of AEBS should automatically imply the equipment of VSF because the system must be reliable beyond the type approval conditions (i.e. straight line on high adhesion surface). An AEBS generates a high braking effort, hence necessary to have a stabilization system. Technically, when there is a technical exemption for EVSC, then it would be necessary to let the fitment of AEBS optional to the manufacturer. Daimler informed having changed their system for

the sake of addressing the stationary obstacles in curves, with late detection and hard braking. They added VSF for addressing those situations.

CLEPA found no need to mandate both antilock and stability systems. They supported mandatory VSF, but could accept mandatory ABS as an alternative. In addition they pleaded for a reference to Regulation N°13.

ABS mandatory: NL, UK, F, S, J, , OICA, CLEPA

EVSC mandatory: OICA, CLEPA (subject to above statement)

S, UK, J: NL: EVSC is not a prerequisite

S, NL: did not support a link to Regulation N°13 because such link would imply administrative problems with the Contracting Parties not signatories to Regulation N°13.

UK, D, J, OICA, CLEPA: supported a link to Regulation N°13 because it would permit a reference to an existing standard and assure some level of safety due to the accurate definition of AVSC in Regulation N°13

At the end of the meeting, J requested that the debate be held again at a subsequent meeting of the informal group.

#### 6.2.1.5. EMC (paragraph 5.1.2.)

The group agreed to copy/paste the wording adopted for the draft Regulation on LDWS (document GRRF/2010/29/Rev.1)

#### 6.2.1.6. Reference to cruise control and Adaptive cruise control (paragraph 5.4.3.)

The experts unanimously challenged the proposal from DK.

Conclusion: references deleted.

#### 6.2.1.7. J proposal for discouraging AEBS off (paragraph 5.4.4.)

D, S, OICA and CLEPA: could not support the J proposal. There is a higher risk of accident if the switch is not in direct reach of the driver.

UK, NL: : preferred not have such button, but if technically necessary, would support the J proposal

Conclusion: proposal remains in [ ].

#### 6.2.1.8. Audibility of the acoustic warning (paragraph 5.5.7.)

UK committed to check the origin of the proposal.

#### 6.2.1.9. PTI provisions

The group agreed to copy/paste the provisions of the draft Regulation on LDWS (document GRRF/2010/29/Rev.1)

#### 6.2.1.10. Proposal for specifications for the radar reflector(s) in consideration of the case that the target carries radar reflector(s)

J: justified the proposal as a need to ensure good target detection; one reflector is deemed not sufficient to well represent a vehicle similar to a passenger car.  
 UK was of the opinion that the currently proposed definition for target is too vague. The UK representative suggested to establish a list of possible targets among which the manufacturer could chose one.  
 D was of the opinion that it is up to the manufacturer to show that his choice is relevant.

Conclusion: UK to provide a proposal for list of possible targets.

#### 6.2.1.11. Provisions for the moving target

The group held some debate about the necessity to add provisions concerning the measurement accuracy.  
 The Chair questioned whether the proposed target speed addresses the test for vehicles of category 3 only. J was of the opinion that the target speed may change according to the category of the vehicle under test.

#### 6.2.1.12. Subject vehicle initial speed (paragraph 6.6.1.)

All parties supported 80 km/h as a subject vehicle initial speed. The experts relied on the expertise of the representatives of the Technical Services for recommending the proper tolerances if needed. All delegations supported the tolerance value proposed in the document AEBS/LDWS-09-01 (+/-2 km/h)

Conclusion: all parties agreed to copy/paste the decision made for the draft Regulation on AEBS-A (see item 6.2.2.10. below)

#### 6.2.1.13. Mandatory warning strategy (paragraph 6.6.2.1.)

J announced to be ready to accept the CLEPA proposal for a window (earliest time for warning). J in addition pleaded for having no cascade for category 2 because the nuisances could be reduced if the 1<sup>st</sup> warning is brought back to 0.8s, making the necessity of a warning cascade collapse. J supported the principle of mandating the same values for all categories of vehicles, but recognized that false warnings are more dangerous in the case of category 2.

NL and UK favoured the same limits for all categories. Perhaps some exceptions could be tolerated for very light category 2 vehicles.

D remained neutral on this item

S found the limit of 0.8 s too small, hence favoured a copy/paste of the values of category 3.

CLEPA could accept differing the warning times according the categories, but pointed out that the proposed values would imply that there is no cascade for category 2.

CLEPA preferred to keep a cascade for all categories.

CLEPA subsequently proposed to suppress the cascade, and only request a window and a latest warning time for all categories

J could support this latest CLEPA proposal

UK requested time for reflection

D, NL, S and OICA could not support the proposal because:

- The value of 0.8 s is too low for safety
- The “window” of warning time was not supported as contradictory to safety



- OICA wondered how to provide data addressing vehicles of category 2 as those vehicles do not exist.

Conclusion: the whole paragraph to remains in [ ] to reflect the lack of consensus.

#### 6.2.1.14. service braking during the warning phase (paragraph 6.6.2.3.)

J, OICA: keen to delete the paragraph

CLEPA: could accept the provision depending on the decision for paragraphs 6.6.2.1. and 6.6.2.2. If the window is wide, there is perhaps a need to limit the maximum deceleration provoked by the warning braking.

NL preferred to keep the provision because had concerns about safety for a following vehicle if the deceleration is low and the stop lamps do not illuminate

S, D and UK supported a provision of a maximum permitted deceleration value.

OICA supported to limit the permitted deceleration during the warning phase to  $4 \text{ m/s}^2$ , and recalled that the stop lamps illuminate as from  $0.7 \text{ m/s}^2$  according to Regulation N°13.

After some debate, the informal group subsequently agreed to limit the text to the two latest warnings and that the principle of a warning cascade is adopted, however with no agreement on the values.

#### 6.2.1.15. Performance limit values (paragraph 6.6.3.)

The experts discussed the need to differentiate the limit values according to the vehicle categories.

NL found unnecessary to make a difference in speed reduction between the categories 2 and 3 because the “light vehicles” (category 2) should have at least the same performance as the heavy ones the expert however could accept some discrimination into the category 2.

CLEPA supported the principle of having different values according to the category.

The expert drew the attention of the group on the fact that some vehicles of category M can transport standees, for whose some high deceleration could be damageable.

UK and D had no opinion on whether differentiating between categories 2 and 3, or between M and N.

S supported NL. The expert was of the opinion the same values should be required for vehicles of category 2 and category 3 because there is currently no experience for vehicles of category 2.

OICA recalled the statement made by CLEPA at the 7<sup>th</sup> meeting of the informal group (see paragraph 6.1.3. - Staggered introduction of the requirements – of the draft minutes of the 7<sup>th</sup> meeting – document AEBS/LDWS-08-01) that the vehicles equipped with pneumatic braking systems are faster because there is a permanent reserve of energy in the braking system, available from the beginning of the braking sequence.

Another parameter to take into account is the fact that the vehicles of category 2 do not have the same mass as the category 3, hence their drivers can react faster to an imminent danger. The expert from OICA was confident that there will be some difference between the two categories, but could not provide input about what could be this difference because there is currently no experience of AEBS with vehicles of category 2.

Conclusion: the Chair detected a tendency for a need to differentiate between categories 2 and 3 and some further sub-categories.

#### 6.2.1.16. Definition of an earliest time for the emergency braking phase (paragraph 6.6.4.)

Japan presented a proposal to introduce a provision regulating the time before which the emergency braking phase cannot start. This proposal includes the Time To Collision (TTC) as a criterion to determine this time limit. The expert clarified that the proposal comes from internal Japanese debates, and that the aim of the proposal is to discriminate ACC (Adaptive Cruise Control) from AEBS. ACC uses long periods to decelerate while AEBS has a limited braking time.

The informal group held a lengthy debate about the necessity of re-introducing the criterion TTC in the text of the Regulation.

NL welcomed the proposal as a way to address the concern of overreliance.

CLEPA found the limit of 3.0s excessive.

OICA, supported by D, found the addition of a new criterion not necessary.

Conclusion:

- The two paragraphs remain in [ ]
- J to provide relevant justifications.

#### 6.2.1.17. FCMS test with a moving target (paragraph 6.7.)

CLEPA made clear that, in their opinion, while the concept is similar for the stationary target situation vs the moving target situation, the same figures should not apply automatically to both cases

The Chair welcomed this comment and underlined that, concerning the deceleration values, there is a need for the informal group to have some in-depth discussions. He reassured the group that there is no intention to copy/paste the values from one scenario to the other.

Conclusion: paragraph 6.7. in [ ], with same wording as paragraph 6.6. (stationary target scenario)

#### 6.2.1.18. AEBS de-activation in the case of obstacles outside the lane (paragraph 6.10.)

J presented the proposal as an additional test to address false warnings

The Chair pointed out that such test was never accepted by the group.

CLEPA recalled that the group never held an in-depth discussion about this kind of test. The expert from CLEPA reminded that some similar proposals were proposed by CLEPA in document AEBS/LDWS-TF02-06 and were not discussed. The expert finally stated that CLEPA can support the concept of the J proposal but finds the CLEPA proposal more appropriate.

S, UK and NL could support the principle of such a false warning test.

OICA found the criteria unclear. In addition, the expert questioned the necessity of regulating this item as the market would automatically condemn a manufacturer who proposes a vehicle failing this test.

D did not support the proposal. The delegate reminded that the type approval test cannot cover all the situations on the road, unless the number of tests is equal to the number of situations. He pointed out that this problem had been already solved in the past via provisions about mandatory documentation.

#### 6.2.1.19. Conclusion: False warning test to be introduced in [ ]

#### 6.2.1.20. CEL annex

The informal group decided to keep the CEL Annex in the draft Regulation.

## **6.2.2. Draft proposal for a Regulation for a Collision Avoidance Emergency Braking System (CAEBS)**

Document: AEBS/LDWS-09-02

### 6.2.2.1. Definitions (paragraphs 2.1. to 2.13.)

The informal group agreed to copy/paste the text of the draft Regulation on collision mitigation.

### 6.2.2.2. Addition of a definition of “self-check” (paragraph 2.15.)

Item in relationship with paragraph 5.2.1.2.1. (permitted delay in illuminating the warning signal in the case of an electrical detectable failure). CLEPA explained the background of the proposal by the wish of the PTI services in EU to enter the vehicle software to read the failure memory. This practice comes from the emissions requirements but is inappropriate for the braking system where low firewalls exist. Hence this proposal that the check requirement is to only look at the bulb.

Support from UK, D, NL (subject to J approval), S.  
J supported the concept.

### 6.2.2.3. Provisions for collision warning (paragraph 5.2.1.1.)

UK, D, NL, S, J, OICA support CLEPA proposal for further details  
AEBS-M draft Regulation to be upgraded accordingly

### 6.2.2.4. Provisions for failure warning (paragraph 5.2.1.2.)

The group held a discussion about the difference between failure and defect, where the experts learned that a defect degrades the performance of the system while a failure prevents the system to function.

UK, D, NL, S support the CLEPA proposal, subject to clarification  
J was concerned about the obligation to detect the defect.

### 6.2.2.5. Provisions for deactivation warning (paragraph 5.2.1.3.)

General support for the CLEPA proposal, subject to improvement of the wording.

### 6.2.2.6. Conditions under which the system must be active (paragraph 5.2.3.)

The informal group supported the improvement proposed by CLEPA.

## 6.2.2.7. Provisions against system false reactions (paragraph 5.2.4.)

Japan clarified that they support the addition of a false braking test, and would challenge the addition of a false warning test. J however found the CLEPA proposed test not reproducible.

The Chair questioned whether the principle of such paragraph is acceptable to the group.

OICA: could support the principle as a recommendation, but had the following comments:

- The provisions should not be contained in a Regulation.
- The wording “should” is unclear.
- It would be impossible for the Technical Service to check all the cases that the proposal attempts to address..
- If the situation would occur, would the authorities reject the vehicle?

The delegate from NL, as representative from a Technical Service, had the following comments:

- Supported the principle
- Recognized that it would be impossible to test all the situations
- Supported the addition of a general paragraph as proposed with the adjunction of a test specific to the false reactions, in order to avoid a situation of being obliged to grant homologation to a system meeting the requirements of the Regulation but providing a lot of nuisances
- The wording “should” is unclear.
- Suggested that the manufacturer shows by documentation that the vehicle is safe under those circumstances

D suggested to include such provisions in the Preamble they committed to produce.

UK partially shared the concerns expressed by OICA and NL. They were keen to have requirements in the Regulation, with no test is required.

S, J and OICA favoured the idea of inclusion of those provisions into the Preamble with no additional test.

CLEPA supported the inclusion of the provisions into the Preamble in addition to the adjunction of a specific test.

Conclusion: provisions to be included into a Preamble, to be written by D.

## 6.2.2.8. Interruption of the system by the driver (paragraph 5.3.1.)

J supported “may” as appropriate for the warning phase, and “shall” as appropriate for the braking phase, because this permits flexibility for the manufacturer.

UK and CLEPA supported mandatory requirements for both the warning and the braking phases, and for both the collision mitigation and the collision avoidance.

NL supported mandatory requirements for both the warning and the braking phase as well, because the brakes can be applied already during the warning phases.

D favoured mandatory requirements for both the warning and the braking phases for the AEBS-A, but, in the case of AEBS-M, supported optional requirements for the warning phase, and mandatory requirements for the braking phase.

S, supported by OICA and J preferred optional requirements for the warning phase, and mandatory requirements for the braking phase in both AEBS-M and AEBS-A.

All parties supported mandatory requirements for the braking phase for both AEBS-M and AEBS-A.

Conclusion: the informal group could reached an agreement that the system must provide the means for the driver to interrupt the emergency braking phase for both AEBS-M and AEBS-A. The proper wording must still be adopted.

#### 6.2.2.9. Details about overriding actions (paragraph 5.3.3.)

D recalled the legal importance of this paragraph because the system must at all time be able to be overridden by the driver.

J pointed out that the request from CLEPA to record the possible actions in the test report was not adopted for the case of the draft Regulation on LDWS.

OICA raised the concern of the industrial confidentiality if all the details are indicated in the test report.

Conclusion: the group did not reach consensus.

#### 6.2.2.10. Warning and activation test with moving target (paragraph 6.6.1.)

All parties agreed with the wording proposed by CLEPA, and to mirror that agreement into the draft text for AEBS-M (see item 6.2.1.12. above).

OICA stressed that, for the sake of mutual recognition between the signatories of the regulations, it is of utmost importance that the test procedures be the same in AEBS-M and AEBS-A. Only the performances may differ.

CLEPA was of the opinion that the two Regulations could substantially diverge, because the avoidance needs some warning in time for the driver to avoid the collision, hence the timing is different compared to the mitigation case.

#### 6.2.2.11. False warning test

CLEPA found necessary to include a test against false warning and against false braking.

J supported this point of view

UK requested time for reflexion

D, supported by S, found necessary to restrict the number of tests to one unique collision test in the Regulation.

NL supported a false warning test according the J proposal. Braking during the warning phase would then be forbidden.

OICA supported D and S, as there is no safety benefits in such additional test.

The Chair suggested to add the draft paragraph 6.10. of the AEBS-M Regulation (see item 6.2.1.18 above) into the AEBS-A Regulation.

Conclusion: false warning test introduced in [ ]

#### 6.2.2.12. Failure detection test (paragraph. 6.7.1.)

Proposal from CLEPA adopted, and to be copy/pasted into the AEBS-M Regulation.

### 6.3. Review of the draft regulatory texts:

#### 6.3.1. Draft proposal for a Regulation for a Forward Collision Mitigation System (FCMS)

Document: AEBS/LDWS-09-01

See item 6.2.1. above

### **6.3.2. Draft proposal for a Regulation for a Collision Avoidance Emergency Braking System (CAEBS)**

Document: AEBS/LDWS-09-02

See item 6.2.2. above

### **6.4. Outstanding issues from previous IG meetings**

Not discussed

## **7. Other business**

The GRRF informal group was kindly invited to a technical tour, at the NTSEL facilities at Kumagaya, Saitama Prefecture.

### **7.1. Greeting by the Chair of the NTSEL proving ground**

The Executive Director of the NTSEL proving ground, Noda san, welcomed the participants to the meeting. He provided a summary of the history of NTSEL and some information about the tests conducted in the Kumagaya facilities:

- NTSEL proving ground aims at performing field tests and approval tests
- It is a support to government for international Regulations.
- The experts from NTSEL take part to WP29 and informal group meetings.

### **7.2. Field demonstration**

The experts had the opportunity to witness field demonstration of two trucks equipped with AEBS:

- Hino truck, running at 80 km/h as initial speed, with a stationary target fixed on the ground. Speed reduction of 30 km/h at the 1st tests, 35 at the subsequent tests (heating of the brake discs and drums)
- Mitsubishi Fuso truck, running at 50 km/h as initial speed, with a stationary target fixed on a mobile wheeled trolley. Collision speed somewhat below: about 20 km/h (speed reduction at about 30 km/h)
- Each expert had the opportunity to experience the AEBS from inside one of the trucks.
- Some trucks were equally available in the garage for static inspection (e.g.: the switch-off control, out of direct reach of the driver).

### **7.3. Debriefing of the demonstration and the inspection**

- The Hino truck experienced 2 brakings. The system releases the brakes when the target disappears. The vehicle is equipped with a crash sensor: in a real crash situation, the truck continues to brake. In the demonstration, there is no real crash, hence the software was modified to avoid terminating the braking phase.
- There is a difference with movie shown at the Bonn meeting, where the truck used to continue its travel after impact on the target: the crash sensor did not function on the Bonn movie, and the software was not modified. hence the brakes were not released. This was a 1st generation system. Today the vehicle experienced a longer deceleration: the software was modified for the show, but the truck would normally continue braking because of the impact.
- One of the board displays showed a shape of speed reduction curve which did not correspond to the braking curve. This is due to the fact that the Japanese guidelines

mandate limited time for warning braking. This explains the deceleration arriving to zero. But the J guidelines do not prohibit continuous braking.

- The Fuso braked up to the end, while it lost the target detection as well as the Hino, because the system assumed there is a crash and the software is such that it considers the sensor is destroyed. Should the target disappear before the crash, the truck would release the brakes.
- Fuso truck scenario contained some variance, due to driver's observance of initial speed. It was noted that an additional source of variance is the surface adhesion. CLEPA commented that this is the reason why CLEPA supports a full braking requirement in the Regulation as the brakes could warm up, up to being fading.

#### 7.4. Presentation of ACEA study

OICA presented the ACEA study on driver reaction time (document AEBS/LDWS-09-05). The expert pointed out that the delay under discussions extends from start of the warning to start of brake pedal being depressed.

### 8. List of action items for next IG meeting

The Chair confirmed the agreement concerning the warning strategy i.e. the regulatory text to address the two latest warnings only and the agreement that the warnings should be displayed in a cascade.

### 9. Schedule for further meetings.

The Chair reminded the experts that the European Commission has the task to base the draft EU Regulation on UNECE Regulation. He announced that the European Commission will make a decision just after the GRRF-69 session on whether to continue the rulemaking in the UNECE platform or continue the process inside the European regulatory framework.

The Chair in addition said that it is to expect that there is a special GRRF session, particularly devoted to AEBS, during the spring.

The Chair finally, on behalf of the whole GRRF informal group on AEBS, warmly thanked the Japanese delegation for their hospitality, kindness and professionalism.