

## Non-paper IGCMS-02-10

### Minutes second meeting IGCMS working group (20+21 April 2009)

Place: Cologne, Germany

Minutes by: Maarten Hogervorst

Date draft: 05/05/2009

Approved on:

Attended by: Josef Krotil (Opel), Rudolf Gerlach (TUV), Jochen Bauer (Mekra), Stephan Scheuer (TRPS), Stuart Matthews (Brigade), Philip Hanson-Abbott (Brigade), Krzysztof Olejnik (MTIVAT), Maarten Hogervorst (TNO), Harry Jongenelen (RDW), Andrea Upmann (Ford), Takazu Fukuoka (Toyota), Takehisa Yamakawa (JAMA), Hidenobu Kubota (JASIC), H.J.Hermann (TUV), Micheal Klein (Motec), Richard Damm (BMVBS), Peter Flanker (Denso), Peter Geissendoerfer (Mekra)

#### Agenda

1. Approval of the agenda
2. Report of the first meeting (IGCMS-01-05)
3. Approval of the Terms of Reference (IGCMS-01-02 Rev. 2)
4. testing of camera-monitor systems
  - a) Common proposal dealing with the testing of CMS
5. Replacement of mirrors by CMS
  - a) proposal for range of vision by Brigade
  - b) number of samples (TNO)
  - c) markings
  - d) items associated with the replacement of mirrors
  - e) use of split-screen
6. Any other business
7. Draft agenda for the next meeting
8. Next meeting, date and venue.

#### 1. Introduction

The chairman (HJ) thanks TUV for offering the facilities for the second meeting of the informal group. SS introduces TUV. All participants introduce themselves.

#### 2. Agenda (IGCMS-02-01)

On request of PHA point 5e is added to the agenda. Minutes first meeting are discussed and approved. Regarding the tasks:

- TASK (SS+MH): decided is to split the group into a general group and a specialized group in which the technical details of the approval tests will be discussed.
- TASK (PHA): PHA has made a proposal for textual changes (IGCMS-02-07). **This paper will be reviewed by all participants and changes/comments will be send to PHA and HJ within one month for discussion at the next meeting.**
- TAKS (MH): the need for 2 samples for testing originates from the testing of mirrors. RDW will take over the certification from TNO and will decide on how many samples are required.

### 3. **Approval of the Terms of Reference (IGCMS-01-02 Rev. 2)**

This document was already discussed in the first meeting and has been approved now.

### 4. **Testing of camera-monitor systems**

HJ introduces the Dutch proposal. SS notes that additional parameters, such as viewing distance, monitor size, Field of View of the camera etc are still issues.

### LUNCH BREAK

HJ asks whether there is support for the Dutch proposal with regard to the blooming test and the visibility of the critical object test. However, there are still many issues that need to be discussed. PHA notes that the requirements for CMSs shouldn't be stricter than for mirrors. SS proposes to establish first what should be discussed and to discuss the details on the second day of the meeting. JK would like to see a justification for the requirements and proposes to have a specification on 3 levels: i) justification, ii) requirement, iii) test. All agree that a blooming test is required. A discussion follows on the need for a blooming test for classes V and VI. HJ indicates that also for these classes blooming can occur when the sun hits the camera via a reflective surface, e.g. a wet road. According to PHA this occurs only sometimes. SS: apart from sunlight headlights can be a source of blooming as well. Depending on the positioning and viewing angle of the camera blooming can be more or less of an issue. SS and HJH indicate that the positioning (min. and max. height) and angle of the camera should be specified in the certificate. MH: with the blooming test described in the Dutch proposal this is not necessary, since the CMS is tested in a general setting. The blooming test can be thought of as mimicking the low sun situation. However, one can also see it as a general test for how well the system can cope with light falling onto the camera (i.e. also applicable to other light sources, such as headlights).

### 5. **Discussion of IGCMS-01-03 Points for attention.doc**

See the updated version of the document.

Additional remarks:

- Regarding failure of the system: ISO-group that includes SS will work on failure of the system. Issues are delay, robustness, freeze risk (according to PHA this is not an issue for analogue systems, so not an acute problem).

- Night sight: RG has better experiences with CMS than without. See also the TNO-report on this issue. JK: leave this to ISO to work out. SS: low luminance should be tested with appropriate monitor settings, possibly low brightness!
- Is a colour CMS necessary or is black and white or mono-colour also sufficient? MH: this depends (in principle) on the tasks that need to be performed for a certain mirror class. Colour can make an object more salient. JK notes that colour blind people are also allowed to drive. The general feeling is that colour should be used in CMSs.
- Do we need different dimensions of the critical object for different classes of devices for indirect vision? PHA notes that for certain classes (e.g. class II) the distance is unspecified. MH proposes to solve this by calculating the detection distance of the critical object via the mirror, and setting this as the requirement for the CMS. All agree. PHA proposes that this idea is tested in practice before it is implemented.
- AU notes that the Field of View (FOV) of a mirror system is not fixed. By moving your head around a different FOV can be obtained. In effect, the Field of Regard (FOR) is therefore larger than the FOV. For CMS the FOR coincides with the FOV. JK: the fixed FOV of a CMS is in some ways an advantage: it doesn't have to be adjusted to the individual driver. KO: the head movement can overcome the blind spots. The issue therefore is whether the FOV of a CMS should be larger than that of a mirror system. TF notes that the regulations are set up with a fixed eye in mind.
- Should the CMS be capable to detect motions in real time? Issues are delay, temporal motion blur. MH: image compression may also become an issue. MH notes that effects such as motion blur and compression can be evaluated using a moving test chart in the acuity test described in the Dutch proposal (TOD-method). See also the TNO-report on this issue.

PHA gives a presentation on the use of split-screen monitors.

## SECOND DAY OF THE MEETING

On the second day the discussion continues on IGCMS-01-03.

- Use of split-screen: PHA: in practice useful is a configuration in which V is displayed permanently, VI up to 30 km/h, when VI not displayed something else may be displayed, e.g. rear-view. HJ notes that in some cases V is also used at higher speed for showing the lines on the roads. PHA: when used in split-screen mode, it should be tested in split-screen mode, such that the requirements for critical perception are fulfilled. MH: this suggests that this should be part of the certificate. RG: too many splits will confuse the driver. Should the configuration be specified? JK: not in favor of restrictions. Leave this up to the manufacturer.
- Would it be possible to get a presentation by a manufacturer of CMS to show the experts what the possibilities are? **Brigade, Motec and Mekra will support the group with a video presentation during the next meeting.**
- Monitor image interpretation: different functions for different classes. Possible tasks: speed estimation (self, or other object), location, distance (according to RG

speed and location/distance are difficult to judge with CMS). RG: with CMS interpretation is difficult and detection is often late. JB: this depends on the resolution and quality of the CMS, but also JB's experience is that detection distances are often short. HJH: for class II higher performance is required. PHA: question for ISO to specify a performance requirement. MH: agrees, needed is a functional analysis of the task requirements, and a set of requirements on the quality of the viewing system. In case the requirement cannot be met with a (current) CMS and it can with a mirror system that's fine.

## SHORT BREAK + PHOTOSHOOT

Proposed is to split the group into a general group and a technical group (metrology group) in which proposals are being made to be discussed in the general group.

A discussion follows on retrofitting. The idea is that what is needed are requirements regarding (JK): i) component approval, ii) installation, iii) retrofitting.

HJ proposes to discuss this issue at the next meeting. **HJ will raise this issue in the GRSG as well.**

**HJ and MH will make a table giving an overview of the various levels: i) justification/task requirement, ii) functional requirement, and whenever possible iii) test proposal.**

## 6. Markings CMS discussion (IGCMS-02-02 Rev.1)

Several possibilities:

- AU: a solution may be to show the certification numbers and details on the monitor display in a certain mode.
- JK: for OEM no markings are required

HJ: markings are needed to check certification. JK: proposes that for OEM no markings are required (is covered by other docs). There should be a means for identification, not necessarily e-markings. RG: KWA requires at least one approval mark on the central unit. HJ: leave it up to the manufacturer which (main) component is marked. RG: serial no. on the different parts can be used as a means of identification. Approval marking should be on the main part. JK proposes:

- e-marking on one of the components, including IDs of all parts
- leave the possibility to display the information on the monitor display.
- means of ID on all parts.
- For OEM no marking required.

## 7. First meeting of metrology group

The metrology group held the first meeting at the end of the second IGCMS meeting and focused on the Dutch proposal for the testing of CMS.

With regard to the blooming area TÜV and TNO have roughly the same test configuration. The group agreed on a light source of 40 kLux and an illumination of the test pattern by 3 kLux. As the size of the light source (TÜV 1-2° and TNO 5°) influences

the maximum acceptable blooming area (TüV 20% versus 10% for TNO) further discussion is needed. Mekra uses a lamp of 0,5° and 40 kLux.

There is also a difference in view on the angle of 10° on which the light source will strike the camera; internal reflections caused by that angle could clarify the difference in the size of the permitted blooming area between the two technical services. Furthermore the properties of the test pattern has to be defined (e.g. reflective properties). MH: note that the camera is generally not aligned with the housing, so this should be taken into account (elevation should be 10 deg with respect to the optical axis to make the measurement more repeatable). Experience is that using no elevation angle is more robust and shows less variation over trials and different samples, without affecting the results much.

In addition the sentence related to the validation of other test methods than proposed by TNO should either be deleted or reformulated. In its present formulation it may prevent the use of more realistic test methods.

An important difference between the methods is that TüV verified the blooming area by means of a real critical object while TNO derives the blooming area by calculating the area in which the contrast falls below a certain threshold value.

Finally it was concluded that Regulation 46 permits the use of split screens; it was suggested that in such a case the systems should be tested in split screen mode.

The discussions will continue on the 10<sup>th</sup> of June 2009.

## **8. Next meeting**

The next meeting of the general group will be hosted by the TUV in Cologne on 10 September, from 9:00 until 17:00.

The metrology-specialist group will gather on the 10<sup>th</sup> of June, from 10:00 onwards at the TUV. Attendants: Stuart Matthews (Brigade), Michel Klein (Motec), H.J.Hermann (TUV), (Ford), Stephan Scheuer (TRPS), Maarten Hogervorst (TNO), Harry Jongenelen (RDW).