Current PL thought regarding task of 26 IWG-SLR, September 2018

It is real challenge to propose true performance based requirements which would be accepted worldwide. But proposing requirements "performance like" only will be probably not successful in longer perspective even many effort will be done.

Beside "**performance based**" requirements the "**technology neutral**" request is raised. But it is result of kind of political pressure which hides "**design based**" motivation. We should be aware of this and properly understand it. We cannot forget that the "**performance based"** requirements might effectively restrict particular existing technologies because of internal restrictions of such technologies which might be insufficient to deliver required performance - basically for safety reasons. Ignoring this reality might lead to **design protecting** requirements which would be effectively **questioned** as not "performance based". Depending on technology details it might mean restriction for some technologies but is no other choice to have really good things on the market. We cannot protect airship transport when autonomous drones become available. But technology discrimination cannot be done intentionally in separation from real performance needs.

Coming to Road Illumination Devices which is most the important issue for safety:

Driver needs regarding road illumination (and glare protection) are in fact very similar and are independent on country or part of the world. They depend on human visual perception nature and processing of stimuli by driver.

If you look carefully for present state of regulation in different countries you can find basic differences between UN ECE (and many countries following it) and American system. UN ECE system for RID includes many different parallel requirements which can be used in the same vehicle (e.g. Reg. 112, 113, 98 or 123). This is **clear evidence** that each of this regulation is in fact design based. Otherwise it will be only one set of UN requirements (minimum worst case) and which would be the same all over the world.

Of course some performance factors are hidden in assumptions of mathematical model of requirements of headlighting. This assumptions were never directly expressed in Regulations however some are used from time to time by lighting experts. It is attached IFAL 2015 paper concerning this issue.

To effectively harmonize worldwide RID (as well as another) on the base of performance it is needed to forget for a moment about requirements what we (and another regulators) use from many years. Because we are used to present system from "beginning of the world "we don't see that they are really **design based.** We are ready to believe that it is performance because some lux or candelas are measured and compared with Regulation values on the same way from many years.

Karl Manz IFAL 2013 paper explanation similarly touch this significant maters which should be treated really seriously. Regarding RID:

"The compromise between range and glare has limits".

Especially there are different limits for static passing beam headlamp based on parabolic design with double filament bulb (**H4** as present minimum requirements) followed by Reg. 48 manual aiming and levelling provisions. For **HID** with automatic levelling this limits are significant step higher. For minimal **ADB** the situation has restriction as well but on the completely another level. If you take into account the best accessible matrix/laser systems this limits will be on even higher level. Nevertheless always it is compromise at given level.

Practically on the road this compromise is **between** the **minimum** performance guaranteed by worst case accepted by presently existing regulatory system and the **best results** of leading manufacturer effort.

Now is the time to look into details for whole spread of this compromise and prepare true performance description which will guarantee level of this compromise acceptable from safety point of view.

Symptomatic is also Gert Langhammer comment to PI question on last 25th SLR:

Mr. Targosinski asked what would be the guaranteed distance for basic passing beam and for motorway beam. Mr. Langhammer clarified that nothing can be guaranteed as there are too many variables.

If nothing can be guaranteed then the Regulations are useless. Present RID Regulations are really insufficient and ambiguous. But people believe that using type approved headlamps and vehicles can drive with any allowed speed at night. Fatalities risk statistics during night-time in relation to day-time are clear evidence against present regulatory system however another research results confirm this opinion as well.

Karl Manz:

"A very good base for performance based assessment of head lamp light distributions under the conditions "as installed" was developed by the CIE TC 4-45 and results in the first glance for classic static head lamps in the Publication No. 188 of 2010 /5/. "

CIE TC 4-45 start working on standard using road surface co-ordinate system and this is proper way. This require to "switch" from thinking in vertical screen points and zones (or its angular equivalents) to road surface and surface (areas) of eyes of glare exposed drivers.

The **mixture of requirements** of present regulations is not proper proposal as "performance" and can be easily questioned or replaced by any other similar (e.g. US FMVSS 108 or modified Chinese).

Therefore Poland again propose to start real merit discussion regarding **true performance** RID requirements. Detachment from existing requirements is the only chance to offer the Europe and another countries valuable proposal promising to be widely accepted.