

Draft Report of
4th Meeting of the Informal Working Group
on
Quiet Road Transport Vehicles for a Global Technical Regulation
July 16th to 18th, 2013
held at the NHTSA offices, Washington DC, USA.

1. Opening remarks by Ezana Wondimneh, GTR Chairman

Mr. Wondimneh welcomed the participants and thanked all for their participation. He summarized the potential benefits of a GTR for this topic and the importance of this IWG meeting. Also, he invited representatives of the other contracting parties to offer opening comments. In response, Mr. Tom Healy (US) briefly reviewed the status of NHTSA's Quiet Car NPRM and indicated comments were still being accepted even though the official comment period had ended. Mr. Nickolas Kakizis (European Commission) informed the group of recent actions which will likely mandate AVAS and reiterated support for development of a GTR in this area. Mr. Roland Jonasch (Canada) commented on the voluntary nature of AVAS (Acoustic Vehicle Alerting System) in Canada and also expressed support of this GTR effort.

2. Introduction of participants and organizations

National bodies:

Canada (Transport Canada), EU Commission, Korea (KATRI), US (NHTSA- Chairman), Japan (NTSEL & JASIC), France (UTAC).

Associations/Researchers/Others:

NFB (US National Federation of the Blind), OICA (Porsche AG, Mercedes-Benz, Volvo Trucks; Volvo Car Corp., General Motors, Ford, Nissan, Honda), ISO, CLEPA (Denso, Brigade Electronics, MEMA), Global Automakers, Auto Alliance, Toyota Motor North America, Dale Kardos & Associates, IDIADA, VSCC (Taiwan), VOLPE.

3. Adoption of the agenda

The agenda was adopted with revisions to allow the planned review of a "technical background" information (section 6) in a timely fashion in order to ensure sufficient time was allocated to review the draft GTR prepared by OICA.

4. **Adoption of the minutes of 3rd meeting**

Canada submitted the following text regarding discussion of certification systems - (recorded in Section 5-“*Discussion on certification systems*”). This was reviewed and approved for addition to the minutes. No other revisions we requested and the minutes were adopted.

Self-certification scheme in Canada – motor vehicle safety regulation

Any vehicle regulated under the Motor Vehicle Safety Act, which is imported or offered for sale in(to) Canada has to be self-certified by the OEM at the time the main assembly of the vehicle is completed. It is the responsibility of the OEM to ensure compliance of its products with existing legislation. Documentation showing proof of compliance must be produced and retained for at least five years from date of manufacturing or importation and supplied to Transport Canada upon request. The test methodologies used by the OEM to certify their products should be in accordance with the test requirements detailed in the Motor Vehicle Safety Regulations.

5. **Update on latest development in the regions**

Covered in the “opening remarks” (section 1)

6. **Consideration and review of the key technical elements for the draft GTR**

Following is brief summary of the documents presented. They are available for review online at the UNECE GTR IWG work site.

(<https://www2.unece.org/wiki/display/trans/GTR+for+QRTV++4th+session>)

-Presentation by JASIC – *Japan Suggestions for AVAS Sound Requirements – Part 2 Measurement in Real-World Conditions*

In follow-up to study data reported in the 3rd QRTV GGTR IWG meeting, JASIC presented “real-world” test results that support adoption of sound requirements that contain at least 2 distinct 1/3 active bands. This data verifies that there is a proportional relationship between audible distance and overall sound pressure. Therefore, this report concludes the volume of the approaching sound should be determined by the required audible distance.

-Presentation by JASIC – *Proposal for the AVAS Requirements*

JASIC presented a summary of their studies on forward and reversing sound requirements. Assuming a background sound level of 55 dBA, and stopping distances of 5m @ 10 km/h and 11m @ 20 km/h, the recommendation is:

	<u>OA Sound Level</u>	<u>1/3 Octive Band Level</u>
Forward at 10 km/h	50	43
Forward at 20 km/h	56	48
Reversing	47	not required

-Presentation by ISO – *ISO 16254 / SAE J 2889-1 Development Status*

A review of actions and conclusions since the last QRTV IWG meeting was given:

- ISO WG42 meeting was held in Warsaw to review issues identified in ballot comments as well as issues identified in SAE comments to NHTSA NPRM.
- A SAE/ISO meeting was held to review testing work conducted for the purpose of evaluating the draft text for technical accuracy, practicability, and clarity.
- Testing indicates both overall SPL and 1/3 octave results can be measured and reported with sufficient precision.
- Proper treatment of modulated signals remains as an outstanding topic.
- Pitch shift can be measured and reported with sufficient precision.
- Using the maximum in each 1/3 octave band, and the overall SPL, as the basis for determining if a test facility is acceptable is a practical and feasible specification.
- Narrowband measurement indoors with simulated vehicle speed provides means to accurately and precisely identify frequency shift.

Planned future work includes:

- July-September 2013: Continuing technical evaluations
- October 2013: ISO WG42 meeting to evaluate draft text (China).
- In 2014
 - Continue technical work as identified: Resolution of any identified technical issues.
 - Incorporation of any comments from QRTV IWG or GRB regarding fitness for purpose.
 - Expect ISO DIS document submitted for ballot in 2014.

-Presentation by UTAC (France) – *France Proposal for AVAS Requirements*

UTAC presented recommendations including:

–Establish the Detectability of EV (with or without AVAS) based on being at least equivalent to ICE vehicles. Therefore, a minimum threshold level for AVAS could be deduced from “low noise” ICE. Also, the sound level to be generated by the AVAS should not exceed the approximate sound level of a similar vehicle of the same category equipped with an internal combustion engine and operating under the same conditions. The maximum sound level is to prevent noise annoyance in quiet urban areas, and to avoid excessive vehicle noise which might mask other important “environmental” sounds. Also, as ICE sound levels are reduced, EV sound levels should not become louder than corresponding ICE vehicles.

-Do not require sound emission in stationary condition, or consider it as an alternative (stationary or start-up/just starting).

-Consider a minimum deactivation speed sound (20 km/h) and a maximum deactivation speed (around 30 km/h). This allows manufacturers the ability to adapt speed deactivation between these two thresholds.

- Consider at least one tone in the “low frequency” range (below 800Hz) and one tone in the “high frequency” range (above 1.25kHz).
- Supports exclusion of sounds as proposed in R.E. 3.
- Pitch shifting shall be at least 8% / 10 km/h.

-Presentation by Brigade - *Brussels Demonstration*

As requested at the Dec. 2012 QRTV IWG meeting, Brigade constructed a demonstration of their AVAS technology. The demonstration focused on the location & directivity of the sound while minimizing the environmental impact (noise outside and inside the vehicle). The demonstration testing was conducted using existing, readily available components, not specifically developed for optimum performance. Due to time constraints the demonstration sound did not include pitch shifting. The demonstration vehicle was shown to achieve the NHTSA NPRM sound performance recommendations.

-Presentation by IDIADA (Juan Garcia) - *Electric Vehicle Alert for Detection and Emergency Response (eVADER)*

A summary of the eVADER project was presented. The primary objective of this work is to improve pedestrian safety without increasing the noise pollution generated by electrified vehicles. The project’s background, organization, objectives, partners, and timing was briefly reviewed. A summary of the concept definition, sound psychoacoustics, method for generating the warning sound, and implementation of into a demonstration vehicle was discussed.

7. & 8. Sketch framework for the GTR –and – Development of the draft specifications and requirements for the GTR

The IWG discussed the draft GTR document prepared by OICA. The draft GTR document included elements from the US NHTSA NPRM, current Japanese guidelines and JASIC recommendations, UN R.E. 3 annex 2, GRB IWG, and OICA. In addition to revisions of the Purpose and Scope, significant time was spent on discussing the need for a sound when the vehicle is “stationary” and/or when “commencing motion”. Also, revisions to clarify the definition of “ten consecutive times” for testing purposes, and pitch shifting requirements were proposed.

The revised draft GTR document is available for review online at the GTR IWG work site. (<https://www2.unece.org/wiki/display/trans/GTR+for+QRTV+-+4th+session>)

9. Next Steps for the Informal Working Group

IWG members who may be able (*Messrs.* Gerhard, Moore, Pare, Bietenbeck, and a representative from JASIC) will meet after GRB in early September to continue refinement of the draft GTR document. This will be in preparation for the December IWG meeting in Tokyo. The goal is to present a draft GTR document at the WP 29 meeting in March, 2014.

10. Interaction of QRTV requirements with noise abatement legislation and programs

No specific discussion on this topic other than as reviewed in the FRANCE presentation.

11. AOB

None presented.

12. Next Meeting

December IWG in Tokyo, Japan.