GRB-TFMU-01-09

(1st session of the GRB TF meeting

Measurement Uncertainties (TF-MU), Mai 22-23, 2019)

**ECONOMIC COMMISSION FOR EUROPE**

INLAND TRANSPORT COMMITTEE

World Forum for Harmonization of Vehicle Regulations (WP.29)

Working Party on Noise (GRB)

Task Force on Measurement Uncertainties (TF-MU)

**Draft REPORT of the 1st meeting of the**

**Task Force on Measurement Uncertainties (TF-MU)**

**From May 22, 2019 starting at 10:00 to May 23, 2019 ending at 16:00**

**Scania Office Round-Point Schuman 2-4, 2nd floor 1040 Brussels**

**Meeting room no.1 on 2nd floor of Administrative building.**

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|  |  | Working Documents\* Documents not available before the meeting |
|  | **Welcome and opening remarks** |  |
| Mr.Ficheux as Chair of the 1st session of this TF decided by the GRB members during GRB-69 in January 2019 opened the 1st session of the Task Force, welcomed all the attendees and thanked the hosts. |
|  | **Introduction of participants and organizations** | TFMU-01-02\* |
| The content of the Attendance list has been reminded by the Secretary of this session to all attendees: Family name, First name, Title, Organization, Country, @mail address, Phone number, Signature.All attendees agreed to share all this information with the other ones, to make this list available on the UNECE website and to receive emails.See participants in the attendance list TFMU-01-02. |
|  | **Adoption of the agenda** | VTNU-01-01TFMU-01-01\* |
| Agenda has been approved. |
|  | **Scope of the TF WG & TF name** |  |
| * This topic has been presented at AC.2 of WP.29 March 2019 session and supported by the attendees.
* The group supported to consider not only Noise issues but also Tyres issues.
* We need to define how to manage the uncertainties:
	+ from a mathematical & statistical approach through a concept in a more neutral way through a strategy.
	+ and then step per step to determine uncertainties, the number of uncertainties, what are the confidential intervals, … We have to balance between tolerances and risks (for instance in 3 categories: unavoidable, manageable to limit them, avoidable) with an uncertainties table.
* It has been reminded that currently for in-service or in-use conformity there is nothing in the UN regulations. Which vehicles to take into account? What means new vehicles? Less than 6 months and less than 1000 km? if nothing in the regulation, do we have to take that into account?
* The limit values in the regulations are smaller & smaller with impact on design for future vehicles and influence of uncertainties & tolerances is more & more important.
* It will not be possible to take into account the influence of the driver.
* Measurement uncertainties is also an important factor for CoP
* Currently in UN-R51-03 Annex 6 related to CoP, the measurements are done with one vehicle and if failed then 2 additional vehicles. With 1dB(A) of tolerance to take into account the production variation. We have to look if this is sufficient or if we need some adjustment.
* For market surveillance, different accredited technical services/institutes will make measurements. Not the same than for Type-approval.
* Different points need to be harmonized as the definition of mro .
* The list of influence factors must be done in a pragmatic way. We have to define or to find out what is the variation. We need a mathematical description including what is already available and then the degree of confidence. We already know what ISO recommends and we do not need to all re-invent.
* We need a kind of procedure for the parameters which can be corrected.
* What kind of document should our group provide? a “Document for reference only”? a Regulation? R.E.3 through a general way how to determine the uncertainties for all regulations (even if the “power” of this document is not the same than a Regulation)? A Practice guide with compensation/correction factors? Revision of the current test methods? Decision can be also done later from discussions with members of other GRs.
* How to transverse our approach to regulations other than those related to Noise & Tyres?
* It has been reminded that we have in ISO standard uncertainties and this is last paragraph in the ISO test procedure never used in UN regulations. A lot of UN regulations have no ISO standard in support.
* We could have a list of what create uncertainties, then experts would be able to decide par regulatory domain what has to be taken into account.
* When the strategy will be described for noise, in theory we should be able to extend the same strategy to all regulatory domains.
* There are different and several performances of tyres (UN-R117). For Rolling Sound, we have quite precise method, for Wet Grip a lot of work is currently in progress to improve the current test method, for Sound Emissions, so far not so many things. The sound performance is at least the 1st one to be considered even if not the only one.
* The group supported to present the way of processing concept on uncertainties to WP.29 in a general approach to cover all regulations.
* Maybe it will not be possible to work on each regulation in the same time.
* It is reminded that ISO is also working on these topics through ISO10844.

***Conclusions: the group supports to have*** * ***in a 1st step a general approach to make possible to transverse it to all regulatory domains for instance through R.E.3, Document for reference only …***
* ***and then to be followed directly in the regulations.***

***The group decided to name this group* GRBP TF-MU (Measurement Uncertainties)**  |
|  | **Exchange of information on GRBP Documents****- (ISO) - Measurement variations****- (France and Germany) - Proposal for a Supplement to the 03 series of amendments to UN Regulation No. 51****- (OICA) - Measurement uncertainties of sound emission measurements according to UN Regulation No. 51-03****- (GRB) Feedback from WP.29**  | GRB-69-26GRB-69-05 GRB-69-15 |
| * **Presentation of document GRB-69-15 (OICA) by Mr.Gerhard:**
	+ In statistical approach 80% confidence is coming from ISO 5130 – if 95% then values have to be multiplied by 1,25.
	+ The current situation in the US has been reminded: limit value at 80dB(A) with similar test method than UN-R51-02 but without tolerance, without rounding … A zone is defined and we have to be inside.
	+ ISO 21748 is more to compare laboratory to another one – ISO 5725 is more general – many parameters but at the end in a small zone
	+ With GUM, it is easier and not complicated to share information– most of the topics in GUM are based on our experience for 20 years from theoretical analysis.

***Conclusion: The group supported to use the GUM.*** * **Presentation of document GRB-69-05 (Germany & France) by Mr.Ficheux**
	+ The idea was to use compensation possible or not? With this proposal, it should be possible to reduce the uncertainties but not to delete them totally
	+ Here we considered that a second test performed on another test track is valid since this test track is compliant with the ISO 10 844.
	+ The aim is to determine a correction (compensation) factor to justify a small difference in the results.
	+ This method can be applied quickly to answer some potential questions
	+ This proposal is not yet mature and maybe if in the future we have a proper compensation then we will not need this proposal.
	+ There are still some questions related to this proposal as:
		- How to select tyres?
		- How to repeat measurement?
		- The formula needs to be reviewed
		- Temperature compensation …
	+ However even if the idea of a kind of compensation is good, it is not so easy to define it for a test track because a test track is alive and change in the time that means that this corrections should be evaluated by measurements periodically.
* **Presentation of document GRB-69-26 ISO16254 (ISO) by Mr.Moore**
	+ The work is ongoing in ISO group and an informal document with a general presentation from ISO is planned for GRBP-70 September 2019 and maybe a proposal of amendment at GRBP-71 January 2020.

***Conclusion: Uncertainties and then compensation factors have to be worked by the group to decrease the uncertainties and then probably tolerances*** |
|  | **General discussion and exchange on how to handle this topic (focus on our Regulations & then share our experiences):*** **Context and intention**
* **Perimeter: start with R 51 with further extensions to other regulations**
* **Two steps approach to solve some issues in a very short term and to work at mid/longer term**
* **General Assessment of uncertainties**
* **Existing uncertainties in regulations or ISO Text**
	+ **Type-Approval / CoP / Market surveillance: tolerance with different test tracks?**
* **How to compare the test tracks? With selection criteria as tyres?**
* **GUM & ISO 5725 approaches (ISO 17 025)**
	+ **Random vs. systematic**
* **Need to have a framework (not ToR)**
* **Number of ‘wrong’ tests acceptable?**
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| See especially Item 4 above. |
|  | **Review of the existing studies and data collection** 1. **Test tracks comparison**
2. **Tyre study (ACEA)**
3. **Round Robin tests (VDA) – to be confirmed 🡪 OICA**
4. **Uncertainties table**
 | 1+3) TFMU-01-03\*4) TFMU-01-06\* |
| * **Test track comparison:**

ISO/WG11: study is ongoing for with tyres. Mr.Perrot will check if it would be possible to share information during next meeting of TF-MU.* **Presentation of document TFMU-01-03 on Round-Robin test (VDA) by Mr.Gerhard:**
	+ Test tracks: aggregate according to usage visible on pictures slide 6.
	+ The measurements presented already include temperature compensation.
	+ With the method proposed, it is possible to calculate a ΔL to get a Lurban corrected.
	+ Next step, from the formula based in 11 test tracks, we need more test tracks data (MPD, g, α) with measurements on vehicles and in parallel of the test tracks to improve our knowledge of the test tracks.
	+ If supported by the group, then tests to be done to validate or correct if needed the proposed formula.
	+ To have something for GRBP-71 January 2020, additional information is necessary – each manufacturer should try the formula.
	+ To make comparison in a pure way, we need same vehicle, same tyres, same equipment … and very difficult to do – so to be done with assessment of the formula.
	+ Virtual average test track – a link has to be created to this virtual test track – would be a part of the type-approval – including usage of the test track – malus/bonus in comparison to an average of the test track.
	+ This approach would be also fair for Technical Service – with a virtual test track, everyone will have the same reference.
	+ From this presentation, we get incertitude for the test track – the compensation can be defined – for the time being this is what we have with already one value – this is a part for noise uncertainties.
	+ Is the formula valid for tyres? No because not the same speed – maybe VDA can calculate for 80kph? Mr.Gerhard will ask.
	+ In a 1st step, a track to track comparison could be useful to start to have a quicker solution because to create a virtual test track could take a lot of time.
	+ At that time, only for C1 tyres.
* ETRTO informs that check is in progress for tyres and hopes to have something for the next meeting

 ***Conclusions:**** ***MÜLLER could be also invited to join some sessions of this TF to share their experience with probably a more precise view.***
* ***Mr.Gerhard will check with VDA, if the formula can be used for tyres after a calculation at 80kph.***
* **Presentation of Excel table TFMU-01-06 for identification of uncertainties based ISO work (OICA) by Mr.Gerhard:**
	+ Are some of these parameters connected to each other is still to be clarified
	+ Legend: Check in column F = we may provide verification
	+ Maybe at the end, it will be possible to merge some parameters
	+ This is the current list and update in progress with industry
	+ Still to identify the classification of the parameters vs. site/site, run/run, day/day
	+ This list is specific for pass-by noise – we could have such list for stationary, ASEP, horn, …
	+ A lot of things come from ISO
	+ Work is ongoing to decide how to manage at the end this information
	+ This is the list to be completed according to our best knowledge, then the value
	+ In addition, identification has to be done for parameters common or dedicated PC/trucks
	+ Also how to manage uncertainties for cruise, for acceleration … has to be defined
	+ L category to be taken into account? How at the end we want to handle this information? To be considered by GRB for instance for an annex in regulation or, document of reference with addition in regulations or, …?
	+ Idea is to introduce compensation as a part of the test procedure
	+ OICA plans to present this table to next GRB with what could be the value and through GUM to elaborate the distribution with different ways of calculation
	+ Should we ask to tyres industry and others to comment and start similar table – this is a preliminary approach 🡪 Request to make the same job for tyres
	+ Collection of comments & material from OICA members is ongoing because since 2004, the data needs to be revised
	+ Based on ISO WG42 works as ISO5130, ISO5725 … and some items have been already eliminated and other items have been added – that is why this is a living table still fully open – all comments are welcomed
	+ If introduction in R.E.3 that means all regulations and we need more time - If we choose to have a “Document of reference” then it can be used by some ‘non-european’ countries - What is the strategy of this group? What place?
	+ A lot of European manufacturers export to non-European countries and currently it is very difficult to harmonize acoustic requirements so huge economic burden – we need more harmonization
	+ Whatever the decision where we place the compensation factor, market surveillance is also for components, … but we are linked to other domains, categories of vehicle, …
	+ We have to do the work in parallel for all kind of methods and we need to see with WP.29 where we can put this work
	+ The aim is to show the approach and to make it easy to encourage/make easier others to join this approach
	+ For UN-R51-03 a Supplement 6 is ongoing – We could have concern to manage the different modifications/amendments UE/UN – we have to find a procedure to make easier the transfer of modifications between UN & EU – also to avoid to make favorable to use EU regulation for instance for backfire and/or the opposite for other topics

***Conclusions: the group encourages*** * ***to join the approach and provide some materials to check the formula proposed***
* ***to think about the differences? (eg. cruising vs. acceleration, how to correct, how to determine, …)***
* ***To work in parallel***
* ***This formula can be provided to interested persons***
* ***Then from additional data how can be made the compensation? Maybe in a short term and then in a longer term?***
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|  | **Exchange of information on national and international requirements****Uncertainties context:*** **For Type approval authorities**
* **For COP**
* **For In-use compliance and market surveillance**
 | TFMU-01-04\*TFMU-01-05\*TFMU-01-07\*TFMU-01-08\* |
| * **Presentation of document TFMU-01-04 TA/ CoP/ In-service conformity/ In-Service compliance/ MS (UTAC) by Ms.Collot:**
	+ CoP & market surveillance only for vehicle in original design
	+ In-use vehicle can have been modified
	+ CoP only can be done by TA authorities - Market surveillance will be done by another service
	+ It is reminded no market surveillance in Geneva but our work could be use also for that
	+ Several countries already make different tests – practically run by ministry of environment or authority of environment – the test track is managed by authority
	+ Consequences are completely different according to the situation in progress: if CoP then maybe recall, if in-service then repairing
* **Presentation of document TFMU-01-05 & TFMU-01-07 on ISO 5725/ ISO 5130 stationary noise (UTAC) by Mr.Ficheux**
	+ Final result is +/- 2dB(A)
	+ Behind this approach there are measurements and calculations, then we need data – with GUM we need less or at least no data but experience – what is for us the most suitable approach? If measurements, how many do we need?
	+ Parallel from Slide 21 can be done to site/site (as operator variation), day/day, run/run approach
	+ ***Mr.Ficheux proposed to request an UTAC statistical expert to join the next meeting***
	+ Tests take time, that means weather variations with the need to have a compensation
	+ Acoustic parameters do not follow exactly? a gaussian approach – for instance the driver does not run at the middle line of the test track, this cannot be a gaussian distribution
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|  | **Actions on uncertainties****Influence of each parameters and how to handle them with the results to as:*** **Tolerance/Value reduction**
* **Statistical conformity**
* **Compensation (parameters)**
* **Compliance (test tracks)**
* **Flowchart for assessment of uncertainties**
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| See other items above and below. |
|  | **Characterization of test tracks variation due to texture*** **ENDt 🡺 See ISO 10844:2014**
* **PSD**
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| Nothing to report. |
|  | **Identification of open issues/ problems** |  |
| See other items above and below. |
|  | **Follow up of project and milestones*** **Key elements / Planning**
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| Chair of this TF-MU is not yet decided, this will have to be discussed at next GRBP-70.The secretary will be provided by OICA.It has been reminded that we need to go forward fast enough to bring some information’s in order to try to solve market surveillance issues in case of results different, to avoid any problems trouble.Compilation has to be done from information from each company.No meeting needed before GRBP 09/2019 – Topic to be discussed during other meetings in between as especially ISO meetings in July.***Conclusion:The approach in 2 steps (general concept/strategy goal & amendments per regulation)*** * ***with a skeleton of proposal in January 2020***
* ***for having a proposal of amendment with a Supplement (in a first time, focus on UN-R51-03 and if possible UN-R117 only for Rolling Sound – work has to be done in parallel on these 2 regulations) in September 2020***

***will be presented at:**** ***AC.2 of WP.29 June or November 2019***
* ***GRBP-70 September 2019***
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|  | **Any Other Business*** **Agenda for next meetings**
* **How to share the documents?**
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| * No new meetings planned for the time being –- to be followed after decision during next GRBP-70 in September 2019.
* Because a dedicated file is not yet available on the UNECE website, a temporary location will be in the file of the IWG ASEP “[Measurement Uncertainties](https://wiki.unece.org/display/trans/Measurement%2Buncertainties)”.
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|  | **Next meeting(s)** |  |
| * ***GRBP-70 September 2019 - Geneva***
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|  | **Adjourn** |  |
| Mr.Ficheux thanked hosts and attendees for the very good organization and fruitful discussions and closed this 1st session of the TF-MU. |

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All documents of this Task Force VTNU will be available via the UNECE website: to be done