

Minutes of the 22nd WLTP IWG Meeting



Location : JRC, Ispra, Italy
Date & Time : 17th 14:00 to 20th 12:00 April, 2018
Documents : <https://wiki.unece.org/display/trans/WLTP+22nd+session>

< > indicates the purpose of each agenda

IS : Information Sharing, D : Discussion, RC : Reach Consensus

***** Day_1 (17th) *****

1. **Welcome & Organisation <IS>** (14:00-14:15)
 - R. Cuelenaere (Chair, TNO) welcomed the group and expressed gratitude to C. Astorga-Llorens (JRC) for hosting the meeting. 48 people joined the meeting. Since vice-chair D. Kawano (NTSEL, Japan) and TS M. Bergmann (Audi) could not attend, the meeting was led by Chair R. Cuelenaere (Chair, TNO) and TS N. Ichikawa (Japan).
 - R. Cuelenaere reviewed the results from the 2018 January WLTP IWG/GRPE sessions, adoption of GTR15 Amend.4 and GTR19 Amend.1, and agreement of one amendment per year.
 - R. Cuelenaere (Chair, TNO) remarked that the GRPE temporary secretariat Mr. Francois Guichard has been replaced by Mr. Francois Cuenot.

2. **Adoption of Minutes & Agenda <IS>** (14:15-14:30)
 - ✧ Minutes of 21st WLTP IWG meeting (WLTP-21-08e) were **adopted**.
R. Cuelenaere (Chair, TNO) thanked M. Bergmann (TS, Audi) for making the minutes.
 - ✧ Proposed Agenda (WLTP-22-02e) was **adopted with slight modification**.
R. Cuelenaere (Chair, TNO) thanked N. Ichikawa (TS, Japan) for making the agenda.

3. **Transposition to UNR <IS & D>** (14:30-15:55)
 [Conclusions]
 - Aim to submit an Informal document at the 78th GRPE January 2019 session as planned.
 - Concrete working schedule and detailed text contents will be discussed under transposition TF.

 - ✧ Status report by **R. Gardner** (WLTP-22-03e)
 - R. Gardner (Consultant, EC) explained WLTP-22-03e. He reported the discussion during 2018 March WP.29 session. The request to OLA to shorten the regulatory process will be sent out some time in April 2018.

- R. Gardner (Consultant, EC) reported that during the 2018 March WP.29 session, EC proposed setting up RDE IWG, a separate IWG from WLTP IWG to consider requirements for RDE. The RDE IWG will be established during the June GRPE. (See [ECE/TRANS/WP.29/2018/80](#) for details.) Therefore, RDE might not be included in UNR 83. This will be clarified at a later stage.
 - R. Gardner (Consultant, EC) also mentioned UNR 101. B. Coleman (VW Group), A. Marotta (EC), Y. Inoue (MLIT, Japan), and C. Lueglinger (BMW) commented on this topic, whether to amend UNR 101 to adopt WLTP or not. Finally, B. Coleman (VW Group) mentioned that since UNR 101 is the latest NEDC fuel consumption and if CPs want to adopt WLTP then those CPs can adopt UNR-WLTP. No one disagreed on his comment.
- ✧ GTR Optional Items by **Secretary** ([WLTP-22-03e_rev1_Appendix-01](#))
- N. Ichikawa (TS, Japan) mentioned that consideration on how to develop the text is needed. He listed EU and JPN regional options of WLTP in [WLTP-22-03e_rev1_Appendix-01](#). If India or other CPs plan to adopt UNR-WLTP, those CPs need to list options in this document to be discussed. From next TF meeting, for example, EC needs to decide if it can accept TRIAS in Japan for engine power and maximum vehicle speed.
 - A. Marotta (EC) asked questions about the schedule of text preparation and Level 2 text. N. Ichikawa (TS, Japan) answered that he expects to have text before the end of this year. He also answered that he does not expect any text for Level 2, because it is to comply with all Level 1.
 - Y. Inoue (MLIT, Japan) requested a time schedule listing which items are to be closed. R. Gardner (Consultant, EC) accepted to make it a discussion point for the next meeting.

< BREAK >

4. Gear Shift TF <IS & D & RC> (16:15-17:00)

[Conclusions]

- Agreed all proposed change. Regarding amendment of Annex 2 Paragraph 4 (c), one reservation was expressed; the timeline of GTR 15 Amendment #5 allows for re-discussing this point after completion of the round-robin.
 - Plan to start final round-robin test from mid-May and the final report is expected in 24th meeting, September 2018 in Tokyo.
- ✧ Status report by **H. Steven** ([WLTP-22-04e_rev1](#))
- H. Steven (Consultant, ACEA) explained [WLTP-22-04e_rev1](#). The highlighted parts are the changes to the original document. He explained that except for

paragraph 4(c), all amendments were discussed and agreed in TF. H. A. Nakhawa (ARAI, India) asked questions on these amendments. On the request of A. Marotta (EC), H. Steven (Consultant, ACEA) was requested to get agreement of TF members by Day #4.

✧ Revisited on Day#4 (20th April)

- H. Steven (Consultant, ACEA) reported that he received a positive response from most of the members. Paragraph 4 (c) was opposed by one member of TF. However, France, Germany, Japan and RDW supported all amendments. Therefore, IWG decided to adopt all amendments. But a member who opposed on Paragraph 4 (c), there will be a possibility for scrutiny reservations till 2018 September.
- Round Robin Test will start from mid-May and the results will be reported in 2018 September WLTP IWG.

5. Drive Trace Index TF <IS & D> (17:00-17:30)

[Conclusions]

- Further discussion on RMSSE criteria and clarification how to apply it to EVs (CD test of OVC-HEV and shortened test procedure of PEV) are expected by TF (still disagreement on RMSSE criteria even though IWG has made a decision to apply regional criteria). Data between Japan/ACEA will be exchanged to check whether the calculation formula is correct.
 - The text improvement about the expression of criteria will be discussed to reflect in Amendment 5, after rounding issue is processed by drafting coordinator.
 - A TF meeting will be held before the 2018 June WLTP IWG.
- ✧ Drive Trace Indices Text Improvement by **JPN** (WLTP-22-05e_Appendix-03)
- Y. Inoue (MLIT, Japan) explained WLTP-22-05e_Appendix-03 regarding editorial correction to use mathematical expression. B. Coleman (VW Group) mentioned that “less than” does not include rounded number. For example, “RMSSE less than 0.8” includes “0.7999...” but “would not include “0.79” after rounding to no places of decimal.
C. Vallaude (UTAC) proposed to make it “0.80”. H. A. Nakhawa (ARAI, India) proposed to use rounding method decided in EPPR (motorcycle) discussion. Since this is not an urgent issue to decide during 2018 April WLTP IWG, this will be discussed after the rounding issue has settled.
 - The rounding issue will be taken care by S. Dubuc (Drafting coordinator, EC).

***** DAY_2 (18th) *****

5. Drive Trace Index TF (Cont.) <IS & D> (09:00-9:50)

- ✧ Application to EV test cycle by **T. Haniu** (WLTP-22-05e_Appendix-01)
 - T. Haniu (Japan) explained WLTP-22-05e_Appendix-01 to respond to a question raised during 2018 January WLTP IWG by C. Lueglinger (BMW), about evaluation of the drive trace index for Charge-Depleting-Test of OVC-HEVs and shortened procedure for PEVs. His proposal was to evaluate cycle by cycle. A. Marotta (EC) mentioned this is different from EU-WLTP 2nd Act, which evaluates all cycles and all complete phases before the breakoff criteria occurs. This topic will be discussed at TF meeting.
 - Y. Khellaf (ACEA) asked a question that driving several phases can affect IWR or RMSSE. K. Engeljehring (AVL) answered from his experience that after 30 min of driving, the driver tends to make errors. However, T. Haniu (Japan) explained that with smooth driving during the last cycle, electric consumption and range will improve and he expressed the need to avoid unexpected advantage. A. Marotta (EC) and B. Coleman (VW Group) proposed to use normalisation. This topic will be discussed at the TF meeting.
- ✧ Drive Trace Indices from Euro RR by **ACEA** (WLTP-22-05e_Appendix-02)
 - B. Coleman (VW Group) explained WLTP-22-05e_Appendix-02. This data comes from the European round-robin test results provided by UTAC. From this graph, most of European lab data are invalid because RMSSE is higher than 0.8. With a request from B. Coleman (VW Group), Japan will deliver their test result to ACEA so that ACEA can confirm that its calculations are correct. This topic will be discussed at TF meeting.

6. Supplemental Test TF with SG EV team <IS & D> (09:50-10:40)

[Conclusions]

- Based on the concept of testing temperature proposed by Japan, **WLTP IWG agreed to set temperature of low-temp. testing @ -7°C.**
 - It is planned to develop an informal document to be submitted to 78th GRPE January 2019 session.
 - Discussion on high temperature and high altitude testing will be reserved until requested by any CPs.
- ✧ Contribution from Japan (WLTP-22-06e_Appendix01)
 - Y. Inoue (MLIT, Japan) explained the revised WLTP-22-06e_Appendix01. He proposed the concept of harmonising test temperature to cover all CP's need. And if CPs can agree on that concept, Japan will agree to a temperature

for low-temp. testing of -7°C. He requested that when high temperature testing is discussed, Japan will want 38°C to be considered. Since no CPs opposed this concept, WLTP IWG agreed to set the temperature of low-temp. testing at -7°C.

- ✧ Status report by **C. Astorga-Llorens** (WLTP-22-06e)
 - C. Astorga-Llorens (JRC), G. D'Urbano (Swiss), and A. Marotta (EC) expressed their gratitude to Japan accepting harmonised temperature at -7°C.
 - C. Astorga-Llorens (JRC) raised an issue about volume of low-temp GTR. M. Morimoto (Japan) mentioned the advice she got while developing EVAP GTR, include to single GTR as much as possible. However, S. Dubuc (Drafting coordinator, EC) said GRPE secretariat Mr. François Guichard have no problem with referencing another UNR/GTR. G. D'Urbano (Swiss) supported a short GTR to avoid legislation burden. This will be discussed at a later stage.
 - M. Nägeli (VW Group, TS of Subgroup EV) requested harmonisation on cycles, Japan 3 phases and EC 4 phases. Swiss and EC are positive on harmonisation.
 - Since Japan mentioned high temperature, B. Coleman (VW Group) and H. A. Nakhawa (ARAI, India) showed interest on how those discussion will be proceeded.
- ✧ Re-visit on Day #4:
 - During a 3-lateral discussion during a coffee break, Japan, EC, and India confirmed that there is no clear request to start high temperature testing. IWG decided to reserve the discussion until requested by any CPs.

<BREAK>

7. **Durability/In Service and COP TF <IS & D>** (11:15-12:35)

[Conclusions]

- For both Durability and COP, it is aimed to submit individual informal documents to 78th GRPE January 2019 session as a separate document from GTR15 amendment 5.
- This should make it feasible to include both Durability and COP into the informal UNR-WLTP document as planned in the Transposition project.

- ✧ Status report Durability by **A. Marotta** (WLTP-22-08e)
 - A. Marotta (EC) explained WLTP-22-08e. He reported that this year, Durability TF will cover 2 points. One is the revision of the current procedure for gasoline and for diesel vehicles as present in UN R83. The other is designing the accelerated bench aging plan to cover combinations of non-regenerative systems and regenerative systems. Both points will follow the scheme adopted

by EU for the revision of the procedure for assessing the durability of replacement after-treatment systems in HDV. N. Ichikawa (TS, Japan) mentioned that covering “design of the accelerated bench aging plan to cover combinations of non-regenerative systems and regenerative systems” was never raised at a TF meeting.

- H. A. Nakhawa (ARAI, India) requested to have a different GTR for durability, because of test fuels. He said India want to use their market fuel, not harmonised test fuel. Since this harmonised test fuel concern is not only for durability but also for other tests, A. Marotta (EC) requested to raise this in GRPE to have decision. (No one volunteered to take a lead.)

✧ COP discussion

- A. Marotta (EC) explained a coffee break discussion with Y. Inoue (MLIT, Japan) on the possibility to have regional COP, Level 1a for EU-WLTP COP and Level 1b for Japan COP. N. Ichikawa (TS, Japan) asked if there is an image of Level 2 COP. Y. Inoue (MLIT, Japan) replied that one of the solution is that all CPs accept all method in Level 1.
- H. A. Nakhawa (ARAI, India) requested to have different a GTR for COP, because of the difference between manufacturer and port of entry testing. A. Marotta (EC) requested to raise this in GRPE to have decision. (No one volunteered to take a lead.)

✧ Timeline to develop Durability and COP

- R. Cuelenaere (Chair, TNO) mentioned timelines. After discussion within WLTP IWG Chair, TS, EC and Japan during Coffee break of Day #4, separate informal document will be submitted to the 2019 January GRPE. Also, those documents will be included in an informal UNR-WLTP document. (See Timeline section of Day #4 for details.)

< LUNCH >

8. Dual-axis Dyno. TF <IS & D> (14:10-14:20)

[Conclusions]

Continue to discuss the restraining method to be incorporated into GTR 15 Amendment 5.

✧ Status report by **I. Riemersma** (WLTP-22-10e)

- I. Riemersma (Consultant, EC) presented WLTP-22-10e to report positive progress of TF. The text for the restraining method is not developed yet but N. Ichikawa (TS, Japan) proposed to include the text in Amendment 5, assuming

developing the text will not take much time after agreement within TF members.

R. Cuelenaere (Chair, TNO) asked for an informal document for the 2018 June GRPE.

9. New Issues TF <IS & D> (14:20-14:35)

✧ Status report by **R. Cuelenaere** (WLTP-22-11e)

- R. Cuelenaere (Chair, TNO) explained WLTP-22-11e to show what topics are under discussion in TF.

10. New Issues TF_R/L determination^{*1} <IS & D & RC> (14:35-17:30)

✧ CFD (WLTP-22-11e_appendix01)

[Conclusions]

Re-open WG activities after completion of GTR 15 Amendment 5.

- M. Morimoto (Japan) explained the status of CFD (computational fluid dynamics) working group using WLTP-22-11e_appendix01. She requested CPs and TAs to join the discussion since most discussion points are related to process of legislation.

C. Lueglinger (BMW) and C. Vallaude (UTAC) supported M. Morimoto (Japan) request. A. Marotta (EC) mentioned that EC was not aware that this CFD working group was founded. He also wanted to know the urgency. Y. Inoue (MLIT, Japan) said that this is a very challenging discussion and should not make a conclusion too early.

WLTP IWG decided to postpone the activity until GTR 15 Amend.5 discussion finishes. However, raising discussion points and handle priorities of each topics, can be done in a meeting in May 2018.

✧ Wind tunnel method (WLTP-22-11e_appendix02, WLTP-22-11e_appendix13)

[Conclusions]

Further discussion on speed dependent $C_d \cdot A$ is necessary for final agreement.

- M. Morimoto (Japan) explained past discussions, points agreed by TF, and new proposal of Japan on calculation method in WLTP-22-11e_appendix02a. C. Lueglinger (BMW) proposed the text for the criteria for the validation process using a wind tunnel and the calculation method. C. Lueglinger (BMW) also proposed to have options to use both Japan and BMW proposed method, depending on a fixed $C_d \cdot A$ or a speed-dependent $C_d \cdot A$. His proposed criteria was $\pm 0.015 \text{ m}^2 C_d \cdot A$, using equipment accuracy. Japan needs time to consider the BMW calculation method proposal.

H. A. Nakhawa (ARAI, India) supported proposal on points agreed by TF, including measuring at 2 wind speed points.

- P. Cognet (PSA) raised the concern on accuracy of load-cells for Class 1 vehicles. He mentioned that there are only $\pm 2N$ accuracy load-cell. This point will be discussed during the TF meeting.

< BREAK >

✧ Split run (WLTP-22-11e_appendix03)

[Conclusions]

Japan proposal needs to be modified based on comments made by IWG member. New proposal will be discussed @ next new issues TF.

- N. Ichikawa (TS, Japan) explained WLTP-22-11e_appendix03 to show the proposal by Japan. Proposal was to add "shall" to first sentence in Paragraph 4.3.1.3.4. of Annex 4. And also, instead of (b), (c) and (d), manufacture is able to omit the overlap run by providing technical evidence for continuity of vehicle condition at each split point. B. Coleman (VW Group) commented that it is strange to add "shall" for a recommendation. He also asked a question on "continuity of vehicle condition" and who is to show the evidence. From his question, the discussion on the technical evidence of "continuity of vehicle condition" took place. N. Ichikawa (TS, Japan) commented that the technical evidence of "continuity of vehicle condition" would be more accurate than current "overlap text" and also shorten the coastdown time. C. Vallaude (UTAC) and A. Marotta (EC) asked what kind of technical evidence should be expected. H. A. Nakhawa (ARAI, India) proposed tyre pressure and temperature. N. Ichikawa (TS, Japan) mentioned it is impossible to measure them during the coastdown test and he raised example like oil and coolant temperature. Japan will prepare data on "technical evidence on continuity of vehicle condition."

✧ Road load measurement (WLTP-22-11e_appendix07)

[Conclusions] Japan plan to provide the concrete proposals if needed.

- N. Ichikawa (TS, Japan) showed WLTP-22-11e_appendix07 which are topics related to the coastdown testing currently discussed in Japan.

***** DAY_3 (19th) *****

11. New Issues TF_Interporation Methods*² <IS & D & RC> (9:10-12:20)

✧ Mysteries of IPF- Mystery#5 ([WLTP-22-11e_appendix04](#))

[Conclusions] Further discussion on Mystery#5 will be expected @ next new issues TF.

- N. Ichikawa (TS, Japan) explained P.6 to 9 of [WLTP-22-11e_appendix04](#). When applying interpolation method, VL f1 coefficient in road load equation will be replaced with VH f1 coefficient to make adjusted equation. However, when calculating Vind road load, a huge error might occur. His proposal was to add an option on road load calculation equation (P.9 of [WLTP-22-11e_appendix04](#)) in case of error. He assumed that this error is caused by uncontrolled ambient temperature during actual coastdown testing. This will also affect European RDE CO2 range. C. Lueginger (BMW) proposed to apply averaged f1 of VL and VH, instead of proposed calculation equation. Japan will check if this works for all manufacturers in Japan.

✧ Mysteries of IPF- Mystery#2 ([WLTP-22-11e_appendix04](#))

[Conclusions] Still no clear interpretation among IWG, but it will be kept as it is.

- A. Marotta (EC) mentioned on P.3 of [WLTP-22-11e_appendix04](#) that whatever the measured values of RRC are for VH and VL (which are used for the approval tests) any individual vehicle shall always use class value RRC for the calculation of its CO2 value with the interpolation method (even in the case this individual vehicle should have exactly the same configuration and the same tyres of VH or of VL).

✧ Mysteries of IPF- Mystery#1 ([WLTP-22-11e_appendix04](#))

[Conclusions] More clear text is expected, but no urgency.

- R. Cuelenaere (Chair, TNO) said this discussion was closed at the New Issues TF in Paris. The discussion concluded that final declared value should be based on class value. M. Morimoto (Japan) asked if “closed” mean no update on regulatory text. She mentioned that the text should be updated so that anyone (not involved in discussion) can read and understand the system. It is because people involved in this work cannot explain the interpretation forever. C. Lueginger (BMW) said if there are something unclear, one should ask. H. A. Nakhawa (ARAI, India) requested that if there is need for clarification, text should be amended.

✧ Mysteries of IPF- Mystery#4 (WLTP-22-11e_appendix04)

[Conclusions] no action is necessary.

< BREAK 10:25 – 11:00 >

✧ Vehicle M concept (WLTP-22-11e_appendix12/appendix05)

[Conclusions]

- Applying Vehicle M concept to ICE: final agreement is up to EC decision.
- EC and Japan will review the new proposal by BMW on selection of Vehicle M.
- Agreed to correct GTR errors (expand IP range, keep absolute range when extension)

- C. Lueglinger (BMW) explained WLTP-22-11e_appendix12. N. Ichikawa (TS, Japan) said Japan agrees on the concept of Vehicle M to be applied to ICE vehicle. However, C. Lueglinger's (BMW) proposal includes a new proposal on Vehicle M selection. Therefore, Japan will review a new proposal. M. Nägeli (VW Group) mentioned that after this discussion is concluded, this Vehicle M selection should be reflected to Annex 8. A. Marotta (EC) said that the check of linearity should have an upper limit of less than 1.5%. He will discuss internally with Technical Authority in Europe if concept of Vehicle M can be applied. I. Riemersma (Consultant, EC) pointed out to just put some weight to set Vehicle M Cycle Energy Demand (CED) to the centre of CED difference. C. Lueglinger (BMW) answered it is difficult to build physical vehicle. N. Ichikawa (TS, Japan) also said that some Japanese manufacturer does not prefer using virtual vehicle for actual test.
- N. Ichikawa (TS, Japan) explained WLTP-22-11e_appendix05. He said there was some errors on the texts which were agreed during 2018 January WLTP IWG, expand IP range, keep absolute range when extension. This will make Annex 8 in line with what was agreed with Annex 6. This is agreed by WLTP IWG members.

✧ Full load curve proposal(WLTP-22-11e_appendix11)

[Conclusions] Revised proposal based on comments is expected @ next new issues TF.

- C. Lueglinger (BMW) explained WLTP-22-11e_appendix11. His proposal is to make vehicles with same engine and same gearshift but different power curve because of software calibration into same interpolation family. M. Morimoto (Japan) asked what would be done for automatic transmission, since this only applies to manual transmission that. H. A. Nakahwa (ARAI, India) asked if this

has no impact on the class of vehicles. C. Lueglinger (BMW) will consider those comments and will be re-visited at next TF meeting.

12. **New Issues TF_others**^{*3} <IS & D & RC> (12:20-16:50)

✧ Span Gas (WLTP-22-11e_appendix08)

[Conclusions]

- Further discussion with experts is expected for final decision.
- Need to see request from gas supplier regarding tolerance @each ppm.

- N. Ichikawa (TS, Japan) said Japan has serious problems regarding calibration gas. According to the GTR text, the tolerance shall be $\pm 1.0\%$. However, for lower concentration gas like CO 50 ppm gas and NO 30 ppm gas, there are no gases with $\pm 1.0\%$ in Japan. He said in Japan, for CO 1.5% for 50 ppm is the tightest tolerance. Also, he proposed a table to clarify text. K. Engeljehring (AVL) and P. Cognet (PSA) mentioned that some gas supplier says that some tolerance in this requirement is too tight. However, H. A. Nakhawa (ARAI, India) says they have no problem in India. R. Suarez (JRC) proposed to invite gas suppliers to update the tolerance. JRC, AVL, TNO, India and Japan will discuss with experts from gas suppliers on this issues for each region.

< LUNCH at 12:45 – 14:00 >

✧ Family Definition (WLTP-22-11e_appendix14/Appendix15)

[Conclusions]

- Further discussion on both contents and implementation timing is necessary.
- Updated information is expected @ next new issues TF.

- J. Dornoff (ICCT) explained WLTP-22-11e_appendix14/Appendix15 on revision of family definition. C. Lueglinger (BMW) expressed his support for the proposal. He highlighted that the proposal shall also consider families that have only a vehicle H, vehicles that have a CO₂ value below the interpolation line and the proposed mid vehicle concept. The proposal was generally supported by Type Approval Authorities (RDW, TUV, UTAC), but they also raised the concern that the impact on the homologation process should be carefully evaluated. They also mentioned that homologation schedules are completely overloaded and therefore timing is an issue. B. Coleman (VW Group) supported the clarification of definition and drafting but he mentioned that a dedicated meeting, preferably face-to-face, should be arranged with all interested stakeholders to further improve the concept and text. M. Nägeli (VW Group) said SG-EV will address the

EV related parts of the text proposal and comments. He supported all comments and requested longer timeframe to discuss this issue, in order make it right. Y. Inoue (MLIT, Japan) said this topic should be discussed carefully and should take long time to discuss. However, he said Japan is positive on discussing this if some fatal problems exist. Japan requested ICCT to list the problems and concerned text, to see urgency. J. Dornoff (ICCT) explained that the problem is not just some text or definition, but that it is the concept of the family definition that is the issue. Y. Inoue (MLIT, Japan) also mentioned that there are very new definitions or criteria added on proposal (e.g. the REESS monitoring vehicle family) without any discussion. I. Riemersma (Consultant, EC) explained that it is just re-location in the GTR 15, not a new concept.

- Based on the feedback of the group, J. Dornoff (ICCT) suggested a face-2-face meeting to continue the work on the proposal with the goal to add this to GTR 15 Amendment 5, which requires an informal document on 2018 June WLTP IWG. A. Marotta (EC) replied he will discuss with European Type Approval Authorities and Technical Services but he cannot guarantee this can be done by June. With comments from B. Coleman (VW Group), J. Dornoff (ICCT) agreed to organize web/phone conference. N. Ichikawa (TS, Japan) again requested the explanation of urgency of the topic since Japan still do not see it but agreed to participate in the proposed Web/phone meeting.

◇ CH-DY (chassis dynamometer) base inertia errors (WLTP-22-11e Appendix 09)
[Conclusions] IWG approved the proposal and will be incorporated into Amd#5.

- T. Haniu (Japan) said he found CH-DY base inertia errors difference between WLTP GTR and US CFR. This criteria in GTR is based on US CFR but it has been changed after GTR developed. He proposed to change it to $\pm 1.0\%$, to make it align with US CFR. WLTP IWG members agreed on this proposal and this will be added to GTR 15 Amendment 5 by drafting coordinator.

< BREAK 15:35-16:10 >

◇ Response factors (WLTP-22-11e Appendix 10a/10b)
[Conclusions]

- No decision was made. However, there was no negative comment on proposals regarding methane response factor and Equipment Calibration.
- Continue to discuss the necessity of propylene/toluene check and its criteria.
- M. Morimoto (Japan) explained WLTP-22-11e Appendix 10a. The proposals were to delete measurement/limit of propylene and toluene response factors,

clarification of methane response factor measurement and frequency of measurement, and revision of instrument calibration sections.

- On measurement/limit of propylene and toluene response factors, H. A. Nakhawa (ARAI, India), L. Hill (HORIBA), R. Suarez (JRC), and K. Engeljehring (AVL) opposed to delete them. They said those should be kept and should be done at major maintenance. K. Engeljehring (AVL) mentioned those measurements/limits are recommendation for equipment manufacturer. C. Hosier (Ford) requested to widen those criteria and this was supported. R. Cuelenaere (Chair, TNO) requested HORIBA and AVL to share some document to explain. These discussions will be continued.
- On clarification of methane response factor measurement/frequency of measurement, and revision of instrument calibration sections, R. Suarez (JRC), and K. Engeljehring (AVL) supported the proposal. No other negative comments were made on these topics.

13. E-Lab. Sub-Group < IS & D > (16:50-17:10)

✧ Status report by **Chair (P. Ohlund)** ([WLTP-22-12e](#))

[Conclusions] So far, no clear modification for Amd#5 is proposed

- M. Nägeli (VW Group) explained [WLTP-22-12e](#). No comments were made.
- During Day #4 discussion, M. Nägeli (VW Group) explained that during the Geneva meeting, a WLTP SG EV meeting will be held on the morning of 6th June Wednesday @NTSEL office. Also, EVE drafting will be held on same day afternoon @NTSEL office. Before Tokyo meeting on September, a couple of web-audios will be held.

*NTSEL European Office: 80, rue de Lausanne 1202, Geneva, Switzerland
Ride Tram#15 to Palais des Nations and get off at Butini. It is a very small room only for around 10 people.

14. Evapo. TF < IS & RC > (17:10-17:30)

[Conclusions]

- IWG has approved a few amendments (calculation formula error, incorrect reference paragraph) after submission of Amd#1.
- Need further discussion regarding the adoption of simplified calculation formula.

✧ Status report by **M. Morimoto** ([WLTP-22-07e](#))

- M. Morimoto (Japan) explained [WLTP-22-07e](#). These topics were approved by WLTP IWG members in Day #4.
- B. Coleman (VW Group) asked to discuss 2 topics: the calibration of equipment and the calculation method error for variable volume SHED on Day #4.

***** DAY_4 (20th) *****

15. Evapo. TF (Cont.) < IS & RC > (9:00-9:50)

✧ Errors on SHED calculation by **B. Coleman** ([WLTP-22-07e_appendix02](#))

- B. Coleman (VW Group) presented 2 topics. One is not urgent, on calibration of equipment. Another is an error on the calculation method for variable volume SHEDs.
- B. Coleman (VW Group) explained [WLTP-22-07e_appendix02](#) which is about error on calculation method error for variable volume SHEDs. He said the proposed equation is physically correct to use for variable volume SHEDs and asked to the equation as an option as in the EPA/CARB. R. Suarez (JRC) questioned the correctness of the example presented by VW as it appeared to be incomplete. M. Morimoto (Japan) explained that EPA/CARB equations proposed by VW is simplified formula. She showed EPA CFR and mentioned that in EPA CFR, both GTR 19/UNR 83 equation and simplified formula are allowed to be used on calculation for variable volume SHEDs. C. Astorga-Llorens (JRC) mentioned the need to compare the definition/requirement for variable volume SHEDs in EPA CFR and GTR 19/UNR 83.
B. Coleman (VW Group) said he wanted to add this option to GTR 19 Amendment 1 at WP.29. and he will check with GRPE secretariat if there is a chance.
- For the calibration of equipment, H. A. Nakahwa (ARAI, India) said if GTR 19 does not have this requirement, this should be included. M. Morimoto (Japan) said since the equipment requirement refers to UNR 83 Annex 7, it can be interpreted that calibration requirement in Appendix to Annex 7 of UNR 83 should be applied. However, she said this should be written clearly that this should be done at next amendment.

4. Gear shift (revisited) (9:50-10:05)

(See Gear shift section on Day 1)

16. CVS T-sensor by OICA (10:05-10:25)

[Conclusions] OICA already submitted the document to modify both R83 and GTR#15. No action for WLTP IWG.

- B. Coleman (VW Group) announced that the working document submitted to the 2018 June GRPE by OICA, to change response time of CVS T-sensor on 0.1 seconds to less than 1.0 seconds. He claimed that there are no manufacturers which have this accurate equipment. K. Engeljehring (AVL) supported this proposal and also mentioned this should be measured in water rather than in

silicone oil, which is not well-defined. A. Marotta (EC) said he doesn't see any problem to correct this if all parties agree. H. A. Nakhawa (ARAI, India) said he doesn't see any need to change this. This is because in diesel vehicle, concentrations or temperatures are measured by every second. He said there exist good response sensors. K. Engeljehringer (AVL) mentioned that the temperature on diesel dilution emissions is 20 to 25°C that it is the worst case.

- [Reference] [ECE/TRANS/WP.29/GRPE/2018/18](#)
 - A. A new Supplement to the 03, 04 and 05 series of Amendments

Appendix 5 of Annex 4, paragraph 2.3.3.2., amend to read:

"2.3.3.2. A temperature sensor shall be installed immediately before the volume measuring device. This temperature sensor shall have an accuracy and a precision of ± 1 °C and a response time of 0,4 **less than 1.0** seconds at 62 per cent of a given temperature variation (value measured in silicone oil)."

6. Supplemental TF (revisit) (10:25-10:30)

(See Supplemental TF section on Day #2)

< BREAK 10:30 - 11:00 >

17. Drafting < IS & D > (11:00-11:50)

- ✧ Drafting Coordinator report **S. Dubuc** ([WLTP-22-13e](#))

[Conclusions] WLTP-22-13e will be modified according to IWG discussion and will be circulated to IWG member. (See [WLTP-22-13e rev3](#) for details.)

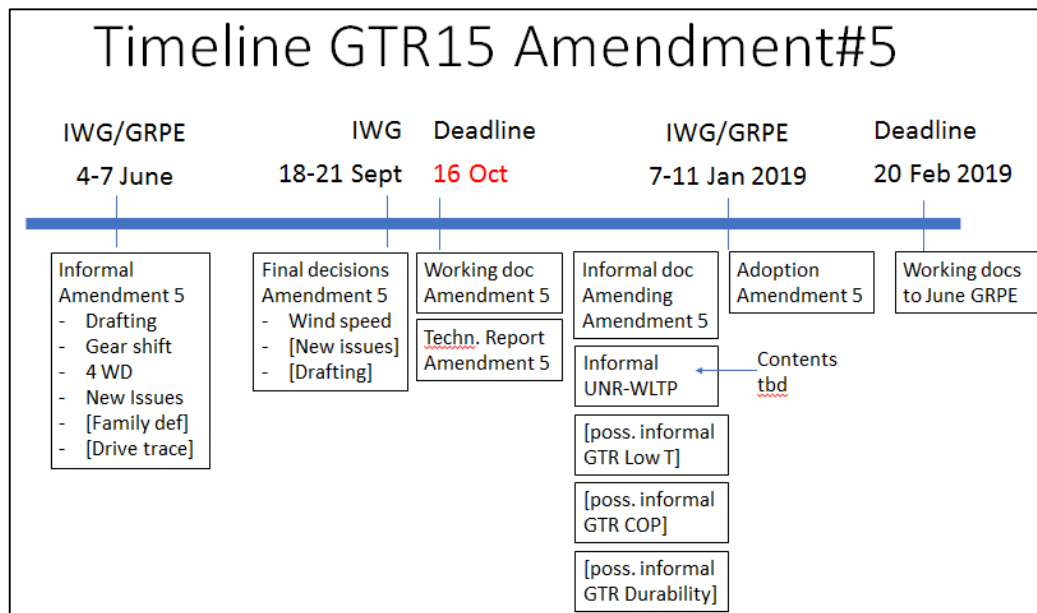
- S. Dubuc (Consultant, EC) explained WLTP-22-13e. See [WLTP-22-13e rev3](#) for details.

- ✧ Latest GTR can be seen @

<https://wiki.unece.org/display/trans/Latest+GTR+15>

18. Timeline GTR 15 Amendment 5.

- R. Cuelenaere (Chair, TNO) explained that during coffee break discussion, there were a clear request from Japan to get approval of Amendment 5 in the January 2019 GRPE. He said there are many informal documents expected for June WLTP IWG for Amendment 5. He showed slides on Timeline GTR15 Amendment#5. (See following picture.) Y. Inoue (MLIT, Japan) and A. Marotta (EC) supported his proposal.
- R. Gardner (Consultant, EC) drew attention to the fact that the 2019 June session GRPE is not on June, but on 21st to 24th May.



19. Meeting schedule <IS> (11:30-12:00)

- ✧ Schedule of upcoming task force meetings
<https://wiki.unece.org/display/trans/WLTP+2018+calendar>
- ✧ 23rd WLTP IWG meeting (week of 4th June, 2018 @ Palais des Nations)
 - Monday 4th June session starts from 10:00 @ Room E, Rue du Grand-Pré 64.
There will be no big screen; need to bring your laptop.
 - Tuesday 5th June morning meeting at the Palais
 - Wednesday 6th June morning, WLTP SG-EV will be held @ NTSEL office.
Same day afternoon, EVE drafting will be held @ NTSEL office.
- ✧ 24th WLTP IWG meeting (18th to 21st September, 2018 @ Tokyo)
 - **Need confirmation of your participation by 23rd IWG @ Geneva. (Japan is arranging the meeting room based on # of participants)**
- ✧ 26th WLTP IWG meeting (date : tbd @ Zagreb, Croatia)
 - F. Akmadza (Hyundai) announced that 2019 April meeting will be held in Zagreb, Croatia with support from Republika Hrvatska Ministarstvo Pomorstva Prometa I Infrastrukture. He said citizens of Japan, Korea, and US do not need a visa. Chinese citizens need a visa. He will check for India.