M I N U T E S

of the 18th WLTP IWG Meeting

Location: Kursaal Bern, Bern, Switzerland

Date & Time: April 18th 13:30 – 20th 13:30, 2017

********** Day_1 (18th April, 2017) **********

< > indicates the purpose of each agenda

IS : Information Sharing,

D : Discussion,

RA : Request for Adoption

1. Welcome & Organization

N. Ichikawa introduces Rob Cuelenaere as the new WLTP IWG chair.

Rob Cuelenaere welcomes the group and expresses that he is looking forward to working with an enthusiastic group that puts lots of energy in the work for WLTP in a field with major political attention. Alessandro Marotta gives a small overview on the work of Rob and stresses that he will also keep his position as Dutch delegate. D. Kawano is not able to join this meeting, but will stay in the vice chair position for the 2017-meetings.

The chair thanks BAFU for the organisation and the great location in Bern. Giovanni D`Urbano (BAFU) welcomes the group to the third meeting in Switzerland. Peter Bonsack (BAFU) gives some housekeeping notes and organisational comments.

2. Adoption of Agenda & Minutes <IS>

- Agenda (WLTP-18-02e) is **adopted.** If time allows discussions on Carryover from Phase 1b will continue on the third day between points 12 and 13 of the agenda.
- Minutes of 17th WLTP IWG meeting (WLTP-17-18e)

  Adopted

  On March 28th Serge Dubuc submitted a working document to GRPE containing all amendments and drafting issues to the WLTP gtr that has been changed since Den Haag. The idea to use this way is to avoid that every little change

like chapter numbers etc. has to be presented and discussed during the IWG meeting.

<<ACTIONS>> Anybody of this group who has an objection with the paper shall report it to the group and to S. Dubuc.

Changes to the working document can be included in the informal document that will be send to GRPE in June.

- Current status and schedule of Phase2 items (WLTP-18-03e)

  Ichikawa-san presents the state of phase 2 working items with the current schedule. The supplemental test task force did not start work on e.g. MAC procedures and eco innovations due to a lack of feedback from the CPs. The ISC started the work later, but the milestones will be kept.

  <<ACTIONS>> The Excel file needs an amendment to avoid misunderstanding (e.g. the black stars in the document identify the completion of working level).

3. Transposition to UNR <IS & D> (14:00-15:30)

- Status report by **R. Gardner** (WLTP-18-04e + appendix)

  Rob Gardner uploaded two documents. He explains that the principle of the full transposition has been confirmed at the 74th GRPE.

  A task force has been set up to move this work forward. Today only EU and Japan are part of the task force, other CPs are invited to join in the process. An informal document will be presented to 75th GRPE in June 2017. UNR WLTP should cover all related gtrs (gtr 15, EVAP etc.) and would need to be accepted by all CPs. The first implementation will be the type I test (gtr 15) with the same timeline as WLTP phase 2b (aiming at a working document for the GRPE session in January 2019).

  Two options for including other tests (type IV, Type VI etc.):

  1. Concept of UNR WLTP + UNR 999 introduced at 72th GRPE
  2. Include all other tests in UNR WLTP using the same cross reference as in UNR 999

  Japan cannot support Option 2 as it might be a problem to distinguish which CP applies which test and as the most stringent Top Level (level 2) cannot always be defined. Note from Task Force: Top Level is about accepting more stringency (like ATCT) sand not about requiring more stringency. The Task

Force will seek further clarification from UNECE and confirmation that the proposed way forward would 'work' under the 1958 agreement.

EU-COM has explained that the idea of having a level 2 regulation with everything included might be complicated. Nevertheless, they state that it should be possible for other CPs to accept additional requirements on level 2 like RDE, since it would not worsen the performance of a vehicle. Something that has to be done a few years after the type approval (e.g. ISC) could be split from the main regulation. EU-COM will check with their legal service if two regulations could be accepted and asks ACEA/OICA to reflect on that. The issue will be dealt with within industry in May (OICA meeting) and reflect how to integrate it in IWVTA.
<<ACTIONS>> Discussions (for more concrete and clear destination) will be continued in the Task Force group.
The IWG decided to re-open the point on 2WD/4WD dual axis dynos in an attempt to solve this outstanding issue within the gtr.

4. Cycle TF <IS & D> (16:00-17:00)

- Status report by **H. Steven** (WLTP-18-05e)
  Heinz Steven gives a status report on open issues (e.g. n_max) and the preparation of the round robin test for gear shift calculation tools.
  A new proposal by N. Ichikawa on "Final deceleration to standstill" has not been discussed, yet.
  Round Robin: data of 28 vehicles are available and will be send out to the group as soon as the ACCESS tool has been updated. Interim results might be available for the next IWG meeting.
  Some vehicles have an engine power curve that make it impossible to calculate shift points with the current ACCESS tool. Small amendments (e.g. n_max) have to be made to the calculation procedure to account for the properties of these vehicles.
  H. Steven will come back with a harmonised proposal in the next meeting.

- Proposal of applicable drive trace indexes and criteria by **T. Haniu** (WLTP-18-06e)

T. Haniu gives an overview on the current state of the drive trace indices and proposes thresholds for IWR (-2 % to +4 %) and RMSSE (<0.8 km/h). T. Haniu asks the group to reflect on the proposed values, to approve or to present counter proposals. A final decision is expected in 21st IWG meeting (January 2018).

Suggestion by Iddo Riemersma: instead of using RMSSE which only reflects speed changes, an index of RMSSE multiplied by the road load would better reflect the relation to CO_2, since the speed differences alone lead to different CO_2 differences in low and high speed phases. T. Haniu responded that he does not expect to compensate the CO_2 values by using indices and it might be difficult to set the threshold for each configuration.

Ch. Lueginger asks why IWR tolerances are not symmetrical and encourages the group to find symmetrical values. According to BMW experience the tolerance for RMSSE is too small, a value of 1.3 km/h might be more appropriate. Japan excluded the tolerances for the use of CoP testing, since CoP drivers might be less experienced than type approval drivers.

India asks if the tolerances can also be applied to class 1 vehicles. India is asked to provide data that show typical values of class 1 vehicles.

EU COM is still working on the normalisation procedure. Alessandro Marotta points out that even if a test has been driven inside of the (drive index) tolerances there might still be a possibility for normalisation.

<<ACTIONS>> EU COM and Japan exchange the view on indices and normalisation. The group are encouraged to provide feedback on Japan proposal and to study on class1 vehicles.

5. EVAP TF <IS & D> (day1 17:00-18:00)

- Status report by **M. Morimoto** (WLTP-18-07e)

  Discussions on sealed fuel tanks procedures are still ongoing. The TF plans to submit a draft gtr text as an informal document for the 75th GRPE. Currently 4 major points are being discussed: Series of procedure or separate procedure for puff loss loading volume, soak temperature, overflow vapour (canister loading) and relief pressure requirement for sealed tank systems.

The TF is working on finding a harmonised solution between EU-COM, Japan and industry proposals.
Bill Coleman expresses that the tests proposed in the current text where not tested with actual vehicles. When this gtr will be decided in June, the legislative text has to be robust enough that vehicles can be developed based on this procedure. Ichikawa-san also expresses, that the time frame is challenging for manufactures especially when it comes to the development of tanks.
Japan intends to write the EVAP legislation based on an informal document, not on an adopted text.
<<ACTIONS>> Seek agreement by intensive discussions in the Task Force.

********** Day_2 (19th April, 2017) **********

6. Supplemental Test TF with SG EV team <IS & D>

- Presentation on ToR and work plan by **C. Astorga-Llorens** (WLTP-18-09e and -10e)

  C. Astorga presents the current time schedule, the next telco will be on April 27th. A consolidated version of the ToR is available, the work plan has been approved during the last meeting in Ispra (March 2017).

  Only final documents will be uploaded to CIRCABC. The main issues of the current work plan were introduced. Eg. Purpose: emissions, CO_2 and range of electrified vehicles. Gtr 15 texts will be the basis of the work of the task force. Concerns are the effects on air quality, environment, health and customer information.

  Action 1: collect all available data and knowledge about vehicle emissions at low and/or realistic winter temperature --> define a temperature and a test procedure

  Action 2: experimental measurement campaign

  Action 3: provide a draft legislation text

  The work shall be finished until June 2018.

  EU COM reflects that the masterplan time schedule could be expanded, since the texts that will be written now, will be in effect for the next 20 years, they have to be profound and well thought through.

  If the text shall be in an annex or a separate gtr should be discussed in conjunction with the outcome of the transposition task force.

  Since low temperature measurements are not of interest for India, India would prefer to have the low temperature issues in a separate gtr.

  According to R. Gardner, GRPE expressed the preference to develop a new gtr.

  Bill Coleman asks the CPs to reflect if the low temp requirements should be part of the same 58 agreement regulation and in the top level regulation and of IWVTA or Universal WVTA?

  Rob Gardner and André Rijnders will contact the UNECE secretariat and ask for advice on the topic of new gtrs and/or Annexes.

- Brief introduction of low temperature test study by **Japan** (WLTP-18-11e)

T. Haniu focusses on evaluating the impact of temperature on emissions and fuel economy. Applied Cycle: WLTP LMH phase, temperatures: -7, +5, +14, 23, 30 °C. Auxiliaries: A/C OFF and ON 25 °C, Road Load setting was compensated (F0 and F2).

The study shows that the road load compensation leads to the unexpected results after a coastdown after a 4 phase WLTP test, which implies that it might not be necessary to compensate the rolling resistance part of the road load (F_0) for the low temperature test.

The results will be discussed during the upcoming low temperature telephone conference on April 27th.

- Key elements to be considered including proposal by **Japan** (WLTP-18-12e)
  M. Morimoto presents a list of items to be discussed during the next low temperature task force meetings.
  <<ACTIONS>> CPs and other parties are expected to provide their feedback on WLTP-18-12e.

7. Durability TF <IS & D>

- Status report by **A. Marotta** (WLTP-18-13e)
  A. Marotta outlines the current proceedings of the group: One f2f meeting, two phone conferences, all documents uploaded on CIRCABC. The work plan has been agreed:

  Action 1: design and carry out an experimental measurement campaign to compare the thermal load of the SRC (standard road cycle) vs. WLTP

  Action 2: Collect all available data on deterioration of GPF (gasoline particle filter) and DeNOx Systems --> if necessary, a revised accelerated bench durability procedure for petrol vehicles can be proposed

  Action 3: Collect all available data on deterioration of SCR and DeNOx systems, durability of EGR systems and other engine related solutions to control NOx emissions from diesel vehicles. --> if necessary, a revised accelerated bench durability procedure for diesel vehicles can be proposed.

  JRC proposed a test protocol, ACEA provided a list of vehicles and aftertreatment technologies. JRC will carry out the first tests, TUEV-Nord/UBA declared the intention to contribute.

Two teams for literature review were established (AECC and TNO).

TNO-LAT will support in the analysis of the literature review and will propose a new procedure for durability testing

Schedule: depending on the outcome of the literature review and the task force´s work, two scenarios are foreseen related to the "amount" of experimental verification needed. The work shall be completed until end of Q2/2017 or in 2019.

In the last quarter of 2017 an idea of the possible deadline will evolve.

The CPs present in the room expressed that they would accept the expanded timeline of the second scenario. India asked if different fuels and Hybrid vehicles would be covered as well, which was affirmed by the task force leader.

At the moment it is not planned to include EVAP in the durability tests. EPA offered collaboration concerning EVAP-issues and to provide data during the last meeting in Geneva. Alessandro will contact Mike Olichew again.

Possible extensions of the time line will have to be discussed during GRPE meetings.

8. In Service TF <IS & D>

- Status report by **A. Marotta** (WLTP-18-16e)
- Presentation on ToR or work plan (WLTP-18-17e)

Background: Work started on March 16th 2017

(In the meantime COM started the preparation of RDE 4th act, dealing with ISC and independent tests and started the WLTP transposition task force.)

Documents will be uploaded to CIRCABC.

The ToR are being revised at the moment. During the task force meeting ACEA provided an overview of the current ISC procedure in the EU, Korea gave an overview on their Road Load verification programme, which is part of their ISC procedure. COM presented the current state of RDE 4th act and the CoP procedure and Japan gave input on their main ideas for ISC.

Time schedule: the announced phone conference on April 26th will be postponed, Japan is currently discussing about whether/how/when to introduce ISC.

At the moment it is not possible to define a clear work plan for the task force, since CP needs are not defined, yet. The feedback will depend on the progress of EU´s RDE 4th act and the development of the transposition task force.
Japan proposes to contact the UNECE secretariat to clarify if this topic is out of scope of the 98th and/or 58th agreement. Alessandro Marotta will ask the secretariat for advice.
Appeal from industry: EU already has the full package with four different aspects: Type approval type I and RDE, COP and ISC. A full OBD Demo for CoP is massive and maybe a destructive process, and is an immense burden for industry. ISC sets the design requirements for the vehicles and gives planning security, but it is understood that the legislator wants to see the full compliance of a vehicle not only after years of use in the field. Industry suggests to try to find a pragmatic compromise and be open minded and flexible not to use all packages.
Marotta conclusion: It is agreed to re-discuss the scope and feasibility of ISC during the upcoming months.

9. OBD TF <IS & D>

- Status report by **M. Morimoto** (WLTP-18-15e)

M. Morimoto: agreement to develop a harmonized OBD gtr until end of 2018. Until now two web meetings. Discussion points: demo test cycle, thresholds to be in the gtr?, inclusion of CoP and ISC in OBD task force, harmonisation with motorcycles, CARB etc.
Definitions will be harmonised until June 2017 in collaboration with EPPR.
Next meeting will be f2f on 2nd of June, Brussels.
EU-COM is still trying to find an appropriate person to support the group.
Mark Monohon (CLEPA) proposes to harmonise definitions that are used worldwide and the group agreed to try to harmonise them where possible and discuss it on a case by case basis.

10. Carryover from Phase1b <IS & D>

- Status report on Annex 4 items by **R. Cuelenaere** (WLTP-18-18e)

R. Cuelenaere: Several new issues have been added to the list of points that possibly will help to make the gtr more precise or to avoid misunderstandings. The separate issues will be introduced by the authors of the papers.

- Japan contributions on Annex 4 by **Japan** (WLTP-18-19e + appendix)
  M. Morimoto gives an overview on the main issues that have been raised by Japan to be on the list. The current description of the wind tunnel test method may have room for different interpretations e.g. for facility maintenance, for wind speeds to be used for the measurement of aerodynamic drag.

  Ch. Lueginger (WLTP-18-22) gives an overview on several issues

  1. Road load at low temperatures (e.g. -7°C): Two possibilities: correct for f0 and f2 or f2, only. Proposal: correct only f2.
  2. Clarification of speed for wind tunnel measurements.
     Movable aerodynamic parts can be at different positions at different reference speeds. To calculate cd*A, they shall be measured at a fixed windtunnel speed in the positions they have at different reference speeds.
  3. Measurement equipment for road load determination
     criteria and calibration intervals are introduced for different tools, e.g. requirement of an ISO 9001 certification
  4. Location of the payload
     The position of the payload for road load determination shall be applied such, that the weight distribution of that vehicle with mass in running order is approximately maintained.
  5. Usage of n/v ratio
     Tests on vehicle L and H should be performed with the same test vehicle and shall be tested with the shortest n/v ratio +- 1,5 % tolerance
  6. Clarification of n/v calculation
     explanatory text
  7. Link between RL family and a RL method
     explanatory text

8. Inter- and extrapolation

   request to reopen the discussion to expand the maximum extrapolation from 30 g/km to 33g/km and change the concept to allow a + 3 and – 3 %

9. Definition of mass in running order

   BMW data show that the average filling level of the tank is in the range of 50 to 60 %. Request to reopen the discussion on the mass definition.

Bill Coleman (WLTP-18-23e): movable aerodynamic body parts

Presents a method that gives a solution on how to deal with movable aerodynamic body parts and how to reflect the “effective position” during a type I test in road load coefficients.

Iddo Riemersma (WLTP-18-24e): mode selection

This section can be found under **12 a.**

Discussions on a selected number of items continued under point 12 a on the agenda.

********** Day_3 (20th April, 2017) **********

11. SG-EV <IS & D>

- Status report by **Chairs (N. Mizushima / P. Ohlund)** (WLTP-18-20e)

  N. Mizushima focusses on the open issues HEV system power, normalisation or drive indices, low temp test and supplemental test (Auxiliary devices) – not active, durability (collaboration with EVE), OBD (no progress) and FCHV, gtr amendments.

  HEV System power: only peak power is needed (for cycle classification and downscaling).

  IWG agreed on the answers of EV SG concerning HEV system power to the questionnaire by EVE. The answers will be explained in more detail.

  <<ACTIONS>>SG EV will send an official questionnaire to the CPs to fill in the durability requirements.

12. Drafting <IS & D>

- gtr amendment by **S. Dubuc** (WLTP-18-21e)

  S. Dubuc gives an overview of the development of the gtr document since the last official issue in October 2016. Except of amendments of the gear shift section, there are mainly editorial changes and clarifications where the text might have led to misunderstandings. Future work: e.g. Consistency of the use of the terms *accuracy, precision, resolution* and *tolerance*.

  <<ACTIONS>>If there are major objections to the current text, the group has time until the next meeting in Geneva to give a feedback.

  Celine Vallaude presented a proposal to clarify the dyno settings (target values + corrections). The proposal was agreed and handed over to S. Dubuc to be included in the informal document amending Amendment no.3 of the gtr.

  Kurt Engeljähringer requests a table of content, to make it easier to navigate through the gtr. S. Dubuc will check if it is possible/allowed to add it.

  EU-COM (A. Marotta) asks the group to scrutinize the current amendment No.3 if there are any inconsistencies. EU-COM wants a clarification on who is

responsible for the technical report and to ensure that it will be sent to the UNECE secretariat in due time.
Switzerland offered to sponsor the work and Serge Dubuc will write the technical report.

12a (new point) carry over parts from phase 1a – revisited

- Continuation of discussions started under point 10 on the agenda.Issues selected to be discussed or solved in this meeting.

Driver-selectable modes (Iddo Riemersma, WLTP-18-24e):

- Add in Annex 6 a new paragraph 2.6.5.3.5 which reads: “Par. 2.6.5.3.1 up to and including par. 2.6.5.3.4 shall apply to all vehicle systems with driver-selectable modes, including those not specific to the transmission.”Add a sentence at the end of 2.6.5.3.3.: "At the request of the manufacturer testing only in the identified worst case mode is also possible."

The proposal was **adopted** in general and will be added at an appropriate position in the gtr (2.6.6.) in the informal document to amend Amendment No.3.

- Location of the payload (presented by Ch. Lueginger, WLTP-18-22e):General concept was accepted, if the approach turns out to be suitable for light commercial vehicles as well.
- ACEA will recheck if the solution is appropriate for light commercial vehicles, since for those vehicles the payload will be mainly on the rear axle.

Usage of n/v ratio (presented by Ch. Lueginger, WLTP-18-22e):

- “Tests on vehicles H and L should be performed with the same test vehicle and shall be tested with the shortest n/v ratio ±1.5% tolerance within the interpolation family.” **Generally adopted**, interpolation families have to be re-checked in the drafting group. IWG-members will have a scrutiny period till the New Issues TF meeting on May 17th.

n/v ratio for 4WD (presented by Ch. Lueginger, WLTP-18-22e):

- Clarification of the n/v calculation in the case where the front and rear tyres have a different radius. Additional text: "If U_{dyn} is different for the front and the rear axle, the value of the ~~mainly powered~~ predominant axle shall be applied. At the request of the responsible authority the manufacturer shall provide the necessary information for that selection."
- IWG wasa positive about the concept. Details will be discussed on May 17th.

Link between road load family and specific method (presented by Ch. Lueginger, WLTP-18-22e):

- For some reason the possibility to use different road load families in one interpolation family is linked to a specific method.
- Scrutiny reservation by Iddo Riemersma: the issue will be discussed on May 17th.

Definition mass in running order (presented by Ch. Lueginger, WLTP-18-22e):

- Japan does not support a change of the definition.
- Several participants express their reservations to open this issue.
- Anyway it will be discussed on May 17th to reflect the background of the issue.

Movable aerodynamic bodyparts (presented by Bill Coleman, WLTP-18-23e):

- **Generally adopted**, details will be discussed on May 17th.

Dual axis dyno:

Iddo Riemersma offered to organize a kick-off meeting for this reopened issue. If appropriate it will be added to the agenda on May 17th

The section **"Carry over parts from phase 1a"** will be renamed to "**New open issues**".

<<ACTIONS>> The issues flagged will be discussed in the new New Issues Task Force to improve or draft a gtr text. The first meeting of this TF will be a web/telco meeting on May 17th.

Connection details for May 17th will be circulated in due time.

13. Meeting schedule <IS>

- 19th WLTP IWG meeting (6th June, 2017 @ Palais des Nations)
  Start scheduled at **10:30 am**
- Schedule of upcoming task force meetings
  Serge Dubuc uploaded a calendar on the UNECE Website and asks the group to indicate changes to S. Dubuc, who will update the calendar (link below).
  https://www2.unece.org/wiki/display/trans/WLTP+calendar
- 20th WLTP IWG meeting will be held in **Korea** (late September or early October, 2017). Time and place will be announced within the next weeks.

14. AoB <IS or D or RA>

- Feedback from round robin tests: A summary will be presented in Geneva during the 20th meeting. All test data will be provided to the group.

For the minutes

Markus Bergmann
(co-secretary of WLTP IWG)