

Minutes of the 10th WLTP IWG Meeting

Stockholm, Sweden

1. **Welcome & organization:**

Chair welcomed participants and thanked the Swedish government for hosting the WLTP Informal Working Group in Skansen Zoo & Museum.

Adoption of agenda & minutes:

Chair introduced the agenda and the minutes of the 9th IWG meeting (WLTP-09-29e) which were adopted without alterations.

Open Issues Table

Update since 9th IWG meeting are monitored by N. Ichikawa in WLTP-10-03e

2. **WLTP Subgroup EV (Annex 8)**

- Progress report (WLTP-10-12e) was presented by chair of Subgroup EV (note: the report included all proposals for discussion. Therefore the documents WLTP-10-07e to -09e of the agenda were not provided separately).
- OIL #50: Proposal of RCB correction (WLTP-10-05e) was introduced. RCB correction factor for NOVC and OVC is determined under warm conditions with the Vehicle H, applied for the Interpolation Family. **Proposal was adopted by WLTP IWG.** Draft text will be provided by the subgroup EV.
- OIL #02 Interpolation family Criteria: ACEA is working on amendments for criteria for OVC and PEV. Result is expected in IWG Meeting #12.
- OIL #55 Phase specific calculation. Proposal was discussed with AER calculation. **EU Com** is requesting interpolation of EAER. SG EV will continue to work the approach and come back with a proposal on that.

- OIL #51 Mode selectable switch:
ACEA provided a proposal (WLTP-10-41e). After discussions WLTP IWG gave the following guidance regarding priorities: 1. follow the drive trace, 2. use of predominant mode, 3. select mode with highest energy consumption, if no predominant is available.

WLTP IWG also requested from Subgroup EV to check the approach for possible loopholes. **ACEA** will distribute the revised proposal for further scrutiny. Issue will be presented again in Meeting #12.
- OIL#52 End of PEV range criteria
(WLTP-10-06e, proposal for adoption was withdrawn):
Three solutions are available. Accepted was downscaling of drive trace. Capping speed is still discussed as well for conventional engines. **EU** will provide conclusion on that in May. **SG EV** will come back with a solution. Consistency between ICE/EV to be ensured.
- OIL #56: Interpolation approach
will be worked out further and presented in IWG meeting #12.
- OIL #58: PEV shorten test procedure:
Proposal of **Japan** is principally accepted. Test conditions like range threshold and constant speed have still to be confirmed.
- OIL#53: FCV test procedure:
Testing method for NOVC FCV follows the GTR for conventional NOVC. Gravimetric method is accepted as reference method, pressure and flow method are candidate methods. OVC FCV are handled in WLTP Phase 2.
Proposal (WLTP-10-10e) was adopted by WLTP IWG. **Japan** will provide drafting text to IWG and DC.

3. Main part & Cycle issues (Annex 1 & 2)

Downscaling / gearshifting (OIL #4-9)

- Progress report was presented by **H. Steven** (WLTP-10-11e)
- OIL #06: Use of the gear box, definition of n_{min_drive}
was elaborated further. Three potential solutions are available; task force will work further on it. Adoption foreseen in IWG Meeting #11.

- Definition of “crawler gear”
is still open. Taskforce worked out an improved proposal. **Japan** provided a counterproposal, which will be evaluated further within the taskforce.

4. RLD & dyno setting (Annex 4)

- Progress report on RLD issues (#10 – 21) was presented by **R. Cuelenaere** (WLTP-10-13e).
- OIL# 18: Wind tunnel method as alternative RLD method
was explained by F. Rohde, C. Vallaude and C. Lueginger in progress report by **BMW/UTAC/VW** (WLTP-10-14e). A complete updated GTR proposal was introduced in detail by BMW (WLTP-10-16e). **Japan** required definition of on-road cdxA and explanation of accuracy criteria of 0.015 m². Amendment was made by **ACEA**. **Japan** requested to reduce 5 Hz to 1Hz with a longer duration. TF will check this with experts. **India** requested definition of maximum vertical force of fixation and explanatory pictures. Draft text for use of chassis dyno will be provided later. Tolerances will be defined until IWG meeting #11.

Validation test program report was given by **UTAC/VW** (WLTP-10-15e).

Results showed equivalency of the compared methods. **Chair** appreciated the work of the taskforce on this issue. **India** supported the approach, requested some additional data from validation.

Proposal was **adopted by WLTP IWG**. Draft text will be provided with amendments by Annex 4 taskforce to drafting subgroup. (**R. Cuelenaere**)

- New item: Determination of overall deviation from coast down method:
Japan proposed to add additional accuracy requirements to the road load determination methods. (WLTP-10-24e). **India** remarked that issue is connected with surveillance testing. **EU Com** indicated a respective element in the future regional WLTP regulation. **WLTP IWG** asked **TF on Annex 4** to further discuss the issue based on the proposal by Japan, incl. review the tolerances and provisions for road load determination in order to reduce avoidable varieties. If coast down would be declared as reference method, it

has to be recognized in the gtr text that not all vehicles are able to be coasted down.

Since the GTR will allow many alternative methods for RLD, the **EU Com** requests in this connection from **TF on Annex4** to prepare a table comparing the methods, giving an overview on the differences (e. g. tolerances), see also agenda item RL extrapolation matrix.

- OIL#10: Wind tunnel for combined approach:
Alternative delta CD*A determination was presented by BMW (WLTP-10-21e). **EU Com** asked about details of simulation available for the authority. **India** asked about the frequency of validating the simulation against wind tunnel measurement. **WLTP IWG** agreed that a sentence shall be added to clarify in which cases a new validation will be necessary (e.g. changes of the model). **WLTP IWG** confirmed the general need of such a method and **approved the approach**. Amended draft text will be provided by Annex 4 TF to Drafting Subgroup before IWG Meeting#11.
- OIL#1b 2: Road Load Family
Progress report incl. validation results was introduced by **BMW** (WLTP-10-17-rev1e).
GTR proposal (WLTP-10-18e) was explained in all details. **Japan** asked for adding the need for an approval in advance of the authority to the selected road load family. Criterion (d) of allowed interpolation family range should be moved to Interpolation Family paragraph. Criterion (e) should be confirmed by **Subgroup EV**. The Road Family concept was **adopted by WLTP IWG regarding the description of the family, implementation in gtr and interpolation range of 35 %**. Amended proposal will be provided to the drafting subgroup by **BMW**.
- OIL#48: Correction Algorithms (Dyno load setting (2.7))
To improve precision of dyno load setting procedure **Audi** proposed maximum time gaps between warming up and beginning of coast down (WLTP-10-19e). **Japan** confirmed 120 s time gap, but no allowance of extension for the fix run

method. **EU** requested inclusion of detailing of necessary evidence. Amended proposal will be prepared by **Audi** for IWG meeting#11.

- OIL# 4, 7, 14- 16, 20: Torque meter method
(incl. road load curve correction / chassis dyno load setting).
Ford confirmed end of validation process and will present the results in the next Annex 4 TF meeting. Progress report and initial proposal is expected for IWG Meeting #11
- OIL# 11,13: Onboard-anemometry / wind conditions:
Progress report was given by **Ford** (WLTP-10-22e). Annex 4 TF will work further on the improvement of the current gtr text, especially cross-wind conditions. **WLTP IWG** recommended updating/improving gtr 15 with extracts of the SAE standard instead of referring to the complete standard.
- OIL# 17: Road Load Extrapolation Matrix:
Combined progress report was presented by **RDW / Daimler** (WLTP-10-23e). New initial proposal was developed and further steps were determined. Definition of representative Multistage Vehicle (MSV) is still under development. **OICA** seeks for opinion of non-European CP's for MSV consideration. **EU Com** requested for clarification summarizing of the three available methods for default road load values. **EU Com** stated that a decision on the scope of application (limitation or open scope) has an influence on the safety margins which need to be fixed to avoid loopholes. **Japan** is interested joining the TF and in transferring the approach as regional option and has at the moment no position on the scope. **WLTP IWG** supported principally the direction of the proposal and gave guidance to proceed with work under the assumption of a limited scope as outlined by RDW/Daimler and with a conservative approach. TF shall also work on the determination method for CO2 values. Other annexes might be involved. Progress report for IWG Meeting #11 and adoption in IWG Meeting #12 is expected.
- OIL# 1b 3: Tyre selection:
Oral status report was given by **K. Steininger** based on WLTP-08-18e. **EU Com** will clarify the request in a written form to ETRTO again. **ETRTO** has to

check availability of data for distribution of aftermarket tyres within the RR classes and will inform EU Com in advance of IWG meeting #11. **India** and **Japan** will observe the outcome.

5. Test equipment and calibrations (Annex 5)

- OIL# 26: Review of comments from I. Riemersma on measurement equipment (WLTP-09-13e) by AUDI, see report from Subgroup Drafting, agenda item 11.

6. Test procedure and conditions (Annex 6)

- OIL# 1b 4, 36: Handling of k_i
Proposals were presented by **N. Ichikawa** (WLTP-10-27e & supplemental). **Germany** remarked the lack of validation data but supported the approach as compromise) Proposals were **adopted by WLTP IWG**. Draft text will be provided by **N. Ichikawa** to SG Drafting.
- OIL# 28: Settings of engine:
Proposal by **N. Ichikawa** (WLTP-10-28e) and the outcome of review by Subgroup Drafting was **adopted by WLTP IWG**.
- OIL# 33: Bag analysis:
Proposal (WLTP-10-29e) was presented by **M. Bergmann**. Industry asked for reviewing the paragraph for clearer prescription. Drafting subgroup will handle the amendments. Main proposal to withdraw the general item from OIT was **adopted by IWG**.
- OIL# 27: Number of tests:
Progress report by **T. Fujiwara** (WLTP-10-30-rev1e) and Japan proposal on dp's were presented. **JRC** explained EU Feedback (WLTP-10-25-rev1e) with proposed values for dp1 and dp2.
ACEA (WLTP-10-26e) commented on the open issue of averaging values and the increased testing effort. **Japan** will provide a proposal for averaging hybrid vehicle cycle results for the next TF meeting.
WLTP IWG adopted the 90 % margin for the criteria pollutants for a second test.

Japan explained statistical effects and proposed a compromise solution with zero tolerance exceeding the declared value for CO₂. **EU Com** stated, that compromise could be reached for the method, but probably only with regional differentiation of dp values.

India requested clarification on the differentiation of authority testing and manufacturer testing witnessed by authority. **JRC** requested clarification of hierarchy of criteria pollutants and CO₂ interaction in the testing flow chart.

Japan will provide an amendment.

Basic Concept of declared CO₂ value based on statistical variance of up to three tests was not objected by CPs

CPs should give positions on three options up to mid of may 2015:

1. Compromise solution with one set of dp values in the gtr
 2. dp values in the gtr, but differentiation regarding type of certification testing
 3. dp values not included in the gtr, will be developed on a regional base
- **OIL# 29, 30, 41: Speed trace violations / Drive Trace Index:**
Progress report / and initial proposal was presented by **N. Ichikawa** (WLTP-10-31e). Other criteria of driving indexes will be studied, results will be presented in IWG meeting#11. Final proposal foreseen for IWG meeting #12.
Germany requested to keep the current tolerance band as additional criterion. A Task Force will be established by **N. Ichikawa**, interested parties in joining are requested to contact WLTP leading team. C. Hosier, A. Marotta, K. Steininger, M. Bergmann, H. A. Nakhawa already announced their interest.
Improvement of current gtr as proposed by **OICA** was accepted for Drafting Subgroup. Prescription to follow accurately the trace shall be valid during whole cycle.
 - **OIL #31: Provisions for Coasting** (WLTP Phase 2 item):
Brief oral status report was given by **T. Vogel**, no meetings and therefore no progress since last IWG.

7. Calculations (Annex 7)

- OIL # 45, 46 Additional pollutants

Progress report was given by **C. Astorga** (WLTP-10-32e & WLTP-10-20e).

Validation tests are foreseen for end of June. Proposals are expected for IWG meeting #12.

8. Determination of system equivalency (Annex 9)

- Proposal for Annex 9 was presented by **K. Kolesa** (WLTP-10-33e). Feedback of the IWG: work should proceed on the proposed basis (distinguish between different scopes / ranges and definitions of ISO 5725 to be applied).

Implementation details will be worked on further by TF. Proposal is expected in IWG Meeting #11.

9. Subgroup Drafting

- Progress report by **Drafting Coordinator**, S. Dubuc (WLTP-10-34e)

Open drafting issues (WLTP-10-35e) and status of Current GTR draft (WLTP-10-04-e & WLTP-10-04e clean) were presented. Drafting Coordinator reminded of the restricted timetable for Phase 1B. Drafting Subgroup will meet again 06/2015 in Brussels with additional teleconferences if necessary.

- Review of VPSD recommendations:

Comparison of WLTP/VPSD definitions by **B. Coleman** (WLTP-10-36e) was explained and welcomed by WLTP IWG. VPSD recommendations will be further reviewed by SG Drafting and provided to IWG for adoption. **Chair** strongly recommended the participation of Subgroup EV members in VPSD IWG for gtr related EV definitions.

10. General issues

- Round Robin exercises:

Brief oral report by **B. Coleman** and presentation by **T. Haniu** (WLTP-10-37e) were accepted by IWG. Round Robin presentations with initial results are foreseen by Japan and EU for IWG Meeting #11

11. Working Issues for WLTP Phase 2

Overview on feedback by CPs and other stakeholders to Questionnaire (WLTP-08-41-rev1e annex) by Japan (WLTP-10-38-rev2e), incl. positions from Japan, EU, India, OICA were given by **K. Kobayashi**.

Common positions were accepted by WLTP IWG for Phase 2. Low Temperature Test for PEV is requested by **EU**, high altitude test by **India**. Durability for batteries depends on work of EVE. CoP is considered as part of the gtr by **EU**, **India** w/o administrative provisions. Auxiliary devices like AC, method for determination of Off-Cycle Credits, Crank Case Emissions and Idle emissions will be further discussed. The outcome of discussions will be summarized in document WLTP-10-38-rev3.

Japan will prepare ToR for IWG meeting#11 and GRPE.

12. Meeting schedule

- 11th WLTP IWG Meeting, Geneva, 10.6.2015, full day (possible extension tbc)
- 12th WLTP IWG Meeting (finalization of WLTP Phase 1B), Tokyo, **Japan** (week of 28th September)

13. AoB

Status of Road Load Tolerance Regulation and Evaluation Criteria in KOREA:

Presentation was given by **KATRI** (WLTP-10-40-rev1e) about methods determining Road Load Tolerance under development. **Korea** (Katri) will provide legislative text on on-board anemometry to Annex 4 taskforce. The proposal of Korea was **supported by WLTP IWG** and the issue will be added to the WLTP Phase 2 mandate list. **EU Com** would have welcomed the basic outlines of a confirmatory test already in WLTP Phase 1B, but WLTP IWG agreed that this should be a Phase 2 item. In Phase 1B only a general provision as proposed by Japan should be included (see WLTP-10-24e).

WLTP IWG
Co-Technical Secretary
Konrad Kolesa