

WLTP-AP Task force

Status Report and Open issues

9th WLTP - *GENEVA, 14th January 2015*
M.C. Astorga

21 January 2015

***Briefing Phone conferences of the
Additional Pollutants Task force***

***26th September
19th December 2014***

WLTP-09-17e

Former information:

Main conclusions of Additional Pollutants VP2 were:

I) Information for NH₃ was enough and accurate to assess the GTR drafting process;

II) not enough information was collected for RCHO and for EtOH.
Reason: not enough instruments to be validated during the VP2-AP

Next steps??

Option A/ make the Validation at the JRC laboratory: candidate suppliers can bring their instruments (analysis of EtOH and/ or RCHO) to be tested alongside JRC reference instruments

Option B/ make the Validation in some other laboratory if there are already instruments available for the measurement of EtOH and/or RCHO

Further work: still possible? Enough time?

Option C/ Round robin phase where reference vehicle(s) could be tested against the laboratory reference and real time instruments.

The timing of the phase will depend on how many laboratories wish to participate (then back to JRC)

At the moment, the above is not yet decided and it is very much dependent of the success of any of the previous experimental actions mentioned in option A or B)

Open question n. 44

AP task force:

based on the text for N₂O and NO₂ (in Annex 5 of GTR, see below)

Same for the NH₃ but for the flow taken directly at the exhaust

Annex 5

- 4.1.3.2.1. A continuous sample flow of diluted exhaust gas shall be supplied to the analyser.*
- 4.1.3.2.2. The average concentration of the NO or NO₂ shall be determined by integration of the second-by-second data divided by the phase or test duration.*

NH₃

“A continuous sample flow of exhaust gas shall be supplied to the analyser. **Directly at the exhaust”**

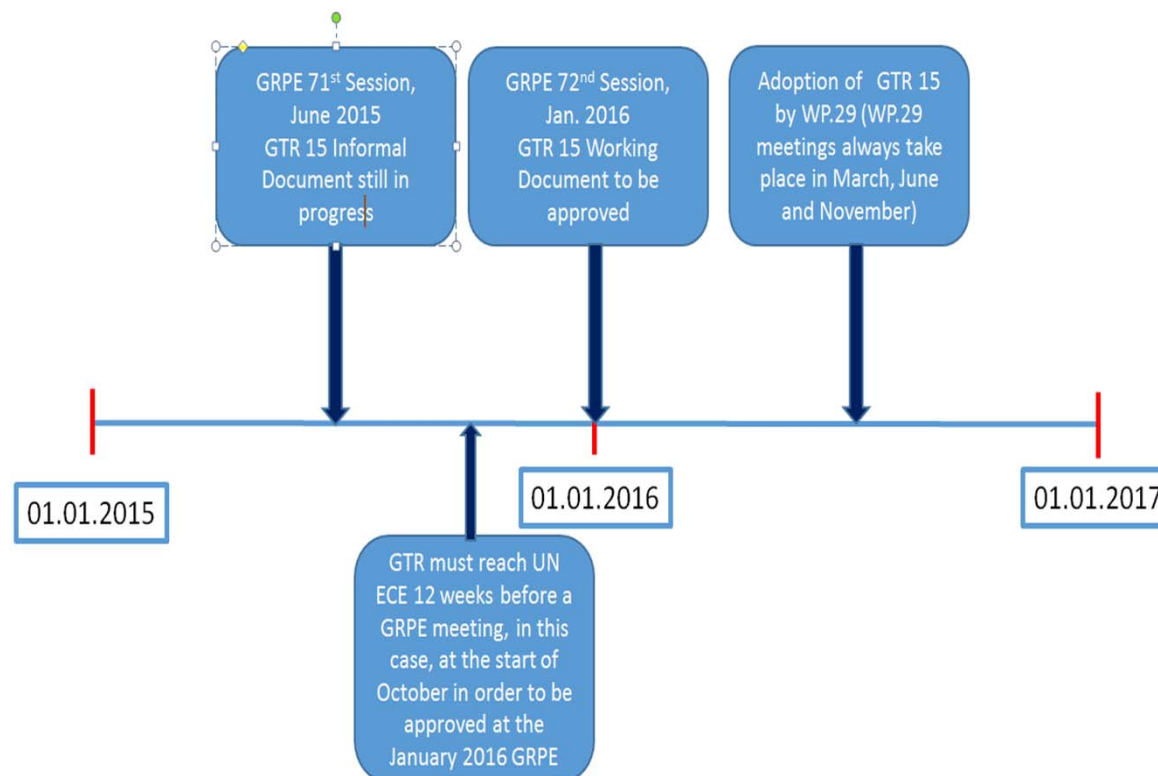
The average concentration of the NH₃ shall be determined by integration of the second-by-second data divided by the phase or test duration.”

Reference Timing:

In order to allow the participation of as many instruments as possible, the likely timing for Option A or B would be from March to May (??) 2015

Future GTR Milestones

WLTP-09-18e



Main conclusion:

***No further progress until the AP task force
has any evidence of the feasibility of
measuring EtOH and Aldehydes in the
diluted exhaust***



Thanks for your attention

For any further questions, contact:

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WLTP-09-04e - GTR Version 19.12.2014.docx

<https://www2.unece.org/wiki/display/trans/WLTP+9th+session>

- (e) NO in nitrogen (the amount of NO₂ contained in this calibration gas shall not exceed 5 per cent of the NO content);
- (f) NO₂ in nitrogen (tolerance \pm 2 per cent);
- (g) N₂O in nitrogen (tolerance \pm 2 per cent);
- (h) C₂H₅OH in synthetic air or nitrogen (tolerance \pm 2 per cent).

7. Additional sampling and analysis methods

7.1. Fourier transform infrared (FTIR) analyser

7.1.1. Extractive sampling Measurement principle ()

7.1.1.1. The sample path upstream of the analyser (sampling line, prefilter(s), pumps and valves) shall be made of stainless steel or PTFE, and shall be heated to set points between 383 K (110 °C) and 463 K (190 °C) in order to minimise NH₃ losses and sampling artifacts. In addition, the sampling line shall be as short as possible. At the manufacturer's request, temperatures between 383 K (110 °C) and 406 K (133 °C) may be chosen. An FTIR employs the broad waveband infrared spectroscopy principle. It allows simultaneous measurement of exhaust components whose standardized spectra are available in the instrument. The absorption spectrum (intensity/wavelength) is calculated from the measured interferogram (intensity/time) by means of the Fourier transform method.

7.1.1.2. The internal analyser sample stream up to the measurement cell and the cell itself shall be heated.

7.1.1.3. Measurement cross interference

7.1.1.3.1. The spectral resolution of the target wavelength shall be within 0.5 cm⁻¹ in order to minimize cross interference from other gases present in the exhaust gas.

7.1.1.3.2. Analyser response shall not exceed \pm 2 ppm at the maximum CO₂ and H₂O concentration expected during the vehicle test.

7.1.1.4. In order not to influence the results of downstream measurement, the amount of sample lost must be limited by in-situ measurement, low flow analysers or the return of by-pass flow. The maximum return of by-pass flow shall be calculated as follows:

$$\text{Flow_lost_max} = \frac{0.005 \times V_{\text{mix}}}{\text{DF} \times t}$$

where:

Flow_lost_max is the maximum return by-pass flow, volume/sec;

V_{mix} is the volume of diluted exhaust per phase;

DF is the dilution factor;

t is the length of the phase, seconds.

7.2. Sampling and analysis methods for N₂O

Comment [SMD360]: EXPERT PROPOSAL: 28.11.2014: from AP (Cova) during WLTP IWG #8 Pune

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Comment [SMD361]: EXPERT PROPOSAL: 04.08.2014 (Hill/Ramscher/Gardner/Adam)

Comment [SMD362]: CONFIRMATION: 12.09.2014.

Comment [SMD363]: EXPERT PROPOSAL: 28.11.2014: from AP (Cova) during WLTP IWG #8 Pune

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VALIDATION PHASE 2 FOR SELECTED ADDITIONAL POLLUTANTS: EtOH & RCHO

WLTP Phase 1b

