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NTE emission limits for RDE legislation: state of play

At the TCMV meeting of 1 July Member States have given a clear mandate to the Commission services for preparing a proposal on regulatory NTE emission limits to be applied for RDE tests as soon as possible, so that a respective vote at TCMV would be possible still in 2015. This note gives a short update on the state of play.

1) NTE emission limits for 1st step

The discussions at the last TCMV left open, whether these values would be decided

- "pragmatically", i.e. on fixing them on the basis of the (lower) NTE emission limits for the 2nd step and the (higher) NOx emissions of today's "mainstream" Euro 6 vehicles

- or via an assessment of technology improvements of today's "mainstream" Euro 6 vehicles that appear to be possible within a timeframe of 2 - 3 years.

To further the second option the Commission services have drafted and sent out a questionnaire to stakeholders. Until now (deadline was 17 August) 4 replies have been received (two from vehicle manufacturers, two from 1st tier suppliers). The Commission services are currently in the process of analysing this feedback.

2) NTE emission limits for the 2^{nd} step

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As emphasised at the last TCMV and supported recently by the discussions in the ENVI and IMCO committees of the EP the Commission services reconfirm that at the 2^{nd} step full compliance with the regulatory requirements of Regulation (EC) 715/2007 must be achieved, i.e. the regulatory Euro 6 emission limits have to be fulfilled under normal conditions of use.

At a first glance this seems to imply a "conformity factor" of 1, i.e. NTE emission limits = regulatory emission limit (e.g. 80 mg/km for NOx emissions of M1 vehicles).

But it has to be acknowledged that RDE test procedures at least at the current stage have higher measurement uncertainties than lab tests. In principle these additional uncertainties can lead to the emissions measured at a RDE test being either above or below the real emissions. This may lead to vehicles actually complying being rejected by a RDE test (manufacturer's risk) or vehicles actually not-complying being accepted by a RDE test (regulator's risk). If manufacturer's

and regulator's risks are kept on a similar level, the NTE emission limits should not be adjusted due to the higher measurement uncertainties. But if for political reasons the manufacturer's risk should be minimised, an additional margin has to be added to regulatory emission limits for defining the respective NTE emission limits.

The JRC has performed a first analysis of these test uncertainties. For a vehicle with real NOx emissions at the upper end of the regulatory limits (i.e. 80 mg/km) the results are the following¹:

- Allowed inaccuracies of the PEMS procedure may introduce an additional uncertainty of NOx emissions compared to lab measurements of about 6 mg/km
- Allowed misalignments of signals may introduce an additional uncertainty of 2-3 mg/km
- The drift of analyzer signals during the on-road test may add an additional uncertainty of 5 – 15 mg/km

If these uncertainties are simply added up, a "worst case" margin of 25 mg/km for NOx emissions is obtained, which would result in a NOx NTE emission limit of 105 mg/km.

However, it is important to note the following facts:

- a. Due to the physics of the combustion process some misalignment of signals will almost always lead to an underestimation of the real NOx emissions¹. Therefore it is in principle not justified to include the corresponding uncertainties in the "worst case" margin.
- b. The drift of analyser signals could be better controlled by ex post measures after the test, therefore the corresponding uncertainty to be added for obtaining the "worst case" margin could be significantly reduced.
- c. In principle the uncertainties from different (independent) sources should be combined by a proper probabilistic error analysis² to obtain the "worst case" margin. The value obtained in such manner would be lower than the "worst case" margin obtained by just simply adding up the different uncertainties.
- d. All sources of uncertainty can be expected to decrease over time due to technical improvements of the PEMS equipment and more experience with the procedure. Therefore the analysis currently performed has to be understood as a "momentary snapshot".

As a consequence the following conclusions can be drawn:

• From a legal and political perspective the Commission services consider the regulatory Euro 6 emission limit + the "worst case" margin resulting from the test uncertainty analysis of the JRC as the upper end of a range of possible NTE emission limits that could be proposed for the 2nd step.

¹ The work of the JRC will be discussed in detail in the RDE-LDV working group.

² This work may still be performed by the JRC or a group of stakeholder experts.

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• The "worst case" margin would have to be revised on a regular basis, e.g. the first time 3 years after the application of the 2nd step of NTE emission limits, as an adaptation to technical progress.

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