



GRPE 70TH SESSION

PMP INFORMAL GROUP PROGRESS REPORT TO GRPE

G. Martini

Sustainable Transport Unit
Institute for Energy and Transport
Joint Research Centre

www.jrc.ec.europa.eu

PMP meetings

2014-04-03: PMP 30th F2F

2014-05-12: PMP 31st telco

2014-07-14: PMP 32nd telco

2014-09-30: PMP 33rd F2F

2015-01-13: PMP 34th F2F

Next planned meeting:

35th Meeting – f2f in Brussels

04 March 2015 – exhaust emission particles

05 March 2015 – non-exhaust emission particles

Non-exhaust particle emissions

(Particles generated by brakes and tyre and road wear particles)

Background

Following the GRPE-69-23 Document (5-6 June 2014) the PMP informal Group has focused its work on 4 working items (WI):

- WI-1: Investigation of typical driving patterns and in particular of typical accelerations/decelerations
- WI-2: Compilation and monitoring of on-going research projects on non-exhaust traffic related particle emissions
- WI-3: Networking and exchange of information with experts in the field of non-exhaust traffic related particle emissions
- WI-4: Development of a set of recommended measurement techniques and sampling procedures

WORKING ITEM 1 - INVESTIGATION OF “TYPICAL” DRIVING PATTERNS

- In order to harmonize future studies and improve the comparability of results “typical” driving patterns (accelerations, decelerations, energy dissipated in braking events,...) will be investigated
- Activity data collected in other projects will be used (i.e. WLTP with >700,000 km of data) – In the last PMP meeting Mr. H. Steven confirmed the possibility of using such database for a first analysis
- “Typical” driving patterns at regional level will be analysed and then compared to check whether an “harmonized” approach is possible
- The list of parameters that should be investigated has to be finalized -The objective is to complete the first step of WI 1 by June 2015

WORKING ITEM 2 - COMPILATION AND MONITORING OF ON-GOING RESEARCH PROJECTS

- In order to fill the existing knowledge gaps large projects with a multidisciplinary approach are required
- On-going projects addressing specific issues related to non-exhaust emissions exist and very often are not known outside the involved groups or organizations
- A living document with the list of the on-going projects and related information (objectives, timeframe...) will be created. This document will be regularly updated
- So far, information on REBRAKE, WBSCD TIP and WEAR TOX are available – involved parties were invited to provide information in face-to-face meetings

WORKING ITEM 3 - NETWORKING AND EXCHANGE OF INFORMATION WITH EXPERTS IN THE FIELD

- In order to properly address non-exhaust particle emissions there is a need to involve relevant experts
- Several experts from the industry and some from research institutes and universities have been already contacted and have agreed to follow the activities and contribute with their knowledge to the work done by the PMP group
- A list of experts will be created in order to enable and facilitate the communication between them and the PMP members

WORKING ITEM 4 - DEVELOPMENT OF A SET OF RECOMMENDED MEASUREMENT TECHNIQUES AND SAMPLING PROCEDURES

- In order to harmonize future studies and improve the comparability of results, the development of a set of recommended methodologies for particle generation and sampling, as well as of recommended measurement techniques is considered necessary
- All the methods that have been proposed/employed for non-exhaust particles generation, sampling and characterization will be reviewed within the PMP group
- A document with a brief description of all the available methods will be created. A comprehensive study of the suitability, advantages and limitations of most promising methods will follow with the objective of make recommendations on their use

- A draft version of the four documents mentioned in the previous slides has been uploaded on the UNECE website in the section dedicated to PMP and will be discussed in the next face to face meeting
- Comments and inputs are requested to further improve these documents and to finalize the list of parameters that have to be taken into consideration for the investigation of “typical” driving conditions

Exhaust particle emissions

(Solid particles generated by the combustion process in internal combustion engines)

NRMM

In agreement with the ToR, two documents were produced:

- Potential issues related to the measurement of PN (30th session – Presentation from Ricardo)
- Guidance for PN testing (31st)

Due to the presentation (25.09.2014) of the proposal for a new Regulation on emissions from NRMM engines, it was decided, in agreement with DG-ENTR and the members of the group, to stop the activities on this topic at PMP level. In case of issues related to the measurement procedure the PMP could resume the work on NRMM

Regeneration

- Presentation on potential issues related to the measurement of PN during regeneration (30th)
- Summary of potential areas of investigation (30th)
 - *Euro 6 vehicles, robustness of PMP, emission levels*
 - *Preliminary tests at JRC confirm robustness of PMP*
- Proposal of experimental plan at JRC (31st)
 - *WLTP input if regeneration at the end of the test*
- Request from WLTP group to address specific issues?

Calibration of PN systems

- Review of open issues (30th)
- Presentation of key areas for improving the calibration procedure (33rd)
- JRC has prepared a questionnaire for optimizing procedures and minimizing areas of future investigation

Sub23nm measurements

Is there a need?

- *There are particles <23nm - Sometimes they are an artifact*
- *“Real particles” are on average 30-40% over a test cycle*
- **Monitoring of newer technologies goes on (at JRC)**

Can we measure <23nm?

- *Artifacts were confirmed - Existing systems with small modification can measure below 23nm (from 10 nm at least with 100x10 PCRf) - Below 10 nm the measurements will have high uncertainty*
- *From 10 nm some areas need investigation (e.g. PCRf definition, catalytic stripper specs, need of new calibration procedure)*

ToR – Extension of scope

- Investigate Particle Number measurements for Non-Road Mobile Machinery exhaust emissions. Prepare report for GRPE
- Engine Dyno Raw exhaust PN measurements for heavy duty for use at Type Approval (to be used as an alternative option to those already existing)

Is the interest in such topic confirmed? Should the PMP group invest resources in addressing it?

Different views on that – 01 Series of amendments to Reg. 132 already includes such possibility

A first feasibility assessment has been proposed - In any case the impact on measurement variability should be carefully evaluated