

PMP Progress Report

Informal document No. **GRPE-59-27**
(59th GRPE, 11-15 January 2010,
agenda item 3)

Activities since GRPE 58

- Heavy Duty Validation testing Exercise completed in October
- Draft report and draft proposal to insert PN measurement into Regulation 49 prepared
- 2 day Informal meeting held at JRC in Ispra on 14th & 15th December to discuss results of exercise, above draft documents and VPR calibration round robin plans
- Documents updated and submitted for consideration by GRPE as Informals 3 & 12, consequential amendments to Regulation 83 also prepared (Informal 4)

PMP Progress Report

Department for
Transport

Ongoing & Future Activity

- Heavy Duty Validation Exercise report & Regulation 49 Proposal to be finalised and submitted as Working Documents for GRPE 60
- VPR Calibration Procedure Round Robin & Workshop scheduled to start March 2010
- Heavy Duty Round Robin exercise – scheduled for completion in mid 2011

PMP Informal 12 – Draft Heavy Duty Validation Exercise Report

- Describes Validation Exercise. Presents results, conclusions & recommendations.
- PN measurement performed well
 - (DPF) Golden Engine results were from $5-8 \times 10^9$ (ETC & hot WHTC) through $2-3 \times 10^{10}$ (WHSC) to 4×10^{11} (cold WHTC) cf $\sim 4 \times 10^{13}$ engine out
 - Repeatability ranged from 20-70%, variability on WHSC was found to be high, due to some passive regeneration on WHSC
 - Reproducibility 41-45% on WHTC, 81-86% on WHSC
 - High tunnel background contributions found in some labs' CVS systems, sufficient to influence results from low emission cycles
 - PFDS and low tunnel background CVS measurements distinguishable from tunnel background across all cycles
- Results from other PN measurement systems conforming to PMP measurement principles generally within 15% of Golden System results

PMP Informal 12 – Draft Heavy Duty Validation Exercise Report

- Recommendations
 - Labs should monitor tunnel PN background and take steps to manage it by cleaning, pre-conditioning and test schedule design
 - Variability in PN emissions on WHSC due to passive regeneration needs to be accounted for in setting PN limit values
 - Retain 23nm PNC cut-off size
 - PN sample flow extraction needs to be compensated for in controlling PFDS proportionality of sampling and (for total sampling type PFDS) in PM calculation
- Plan to finalise and submit as Working Document (English only) for GRPE 60
- Any further comments in writing by end of February please

PMP - Informal 3 Regulation 49 Proposal

Department for
Transport

- Inserts PN measurement into Reg 49 as a new, unreferenced Annex 4C
- Specifies procedures for determining PN over Annex 4B (WHDC) test procedures
- Details PN measurement system specification (consistent with Regulation 83, Annex 4A, Appendix 5)
- Compensation for PN sample flow extraction required in controlling PFDS proportionality of sampling and (for total sampling type PFDS) in calculating PM
- PN calculation as per Regulation 83, using total (equivalent) dilute exhaust mass flow, divided by density to give volumetric flow, multiplied by pcrf, PNC linearity correction factor and mean particle concentration over test

PMP - Informal 3 Regulation 49 Proposal

Department for
Transport

- Includes measurement of PN during periodic regeneration, with weighted average result calculated according to WHDC procedures
 - Multiplicative or additive, upward or downward regeneration adjustment (k) permitted.
- 14% cold WHTC weighting factor used as per latest WHDC agreement
- Includes some clarifications to PN measurement equipment specification

PMP – Informal 4 Regulation 83 Proposal

- Makes consequential clarifications to PN measurement system in Regulation 83
- Corrects Figure 13 which appears to show PM sampling probe outer, rather than inner, diameter as 12mm