GFV-18-07

Minutes of the Meeting
Informal Group Gaseous Fuel Vehicles
(Held jointly with the Heavy Duty Dual-Fuel Task Force)
29 February 2012
Brussels (DG Enterprise) Brey Building

GFV Meeting

I. Welcome and introductions

1. Mr. Rijnders welcomed the group, with apologies for a late start due to security issues at the entrance.

II. Adoption of minutes of the previous meeting

2. Mr. Rijnders asks if there are changes or questions about the minutes of the previous meeting and there are none.

III. Agenda for today (changes/additions)

3. We will make adjustments to this crowded agenda because some stakeholders are not present yet or have to leave early. GFV issues will be dealt with first and HDDF will come early in the afternoon.

IV. Gaseous Fuel Vehicle Definitions for WLTP: Gaseous Fuelled Vehicles Related Definitions Overview of the UNECE and EU Legislation for LDVs (See document GFV-18-02)

4. The GFV is supporting the informal group on World Light Duty Vehicle Test Procedures (WLTP) action to harmonize the definitions of vehicle propulsion systems. The GFV is focusing on definitions related to gaseous fuel vehicles.
5. The discussion document is amended to include light duty ***and*** heavy duty definitions, to ensure they are consistent and compatible. The title of the document, therefore, is amended to read: *Gaseous Fuelled Vehicles emission-related definitions: Overview of the UNECE and EU Legislation for LDVs and HDVs*. For consistency 'heavy duty natural gas vehicles' is added to the first paragraph to indicate the broader scope of the document.
6. Dual-fuel definition: Added to the term 'engine' is 'engine system', which is now compatible with amended dual-fuel definitions in the HDDF TF documentation.
7. Other editorial changes are made, including references to certain directives not related to the definitions and some corrections of the references to other documents.
8. 'Member of the family.' No inconsistencies are found in the definitions in Regulation (EC) 692/2008 and ECE R 83 but Mr. Renaudin suggests to review ISO documents for consistency of the terminology.
9. There is a brief discussion of whether reference to the Pressure Directive (97/23/EC) should be kept in. It is decided that there are no inconsistencies found in the definition of 'Pressure' included in Pressure Equipment Directive (97/23/EC) and ECE R 110 and the reference is maintained.
10. The revised document will be sent to Stefan Redman and Bill Coleman who are working on the WLTP definitions.

V. Report on LNG Task Force Meeting, 2 February 2012 (Brussels) (Mr. Seisler, NGV Global)

11. Mr. Rijnders asks Mr. Seisler to report briefly on the developments in the LNG TF.
12. Mr Seisler informed the GFV about the LNG TF and the activity on the creation of a new LNG companion regulation to R.110 or to proceed with amending current R.110 with

LNG provisions. There was discussion about this issue at the first LNG Task Force meeting and a decision was made to amend the current R.110. Since then, however, the issue has been raised again within the Task Force and at the Informal Group on GFV. The decision was re-visited again, looking at the pros and cons of each option but also considering new factors, including industry concerns about the time it is taking on the current path to create LNG regulations for vehicles, and that creating a new regulation would take even longer. A decision was made to continue amending R.110 instead of developing a completely new LNG regulation. A new Annex 3B for LNG will be added pertaining to vacuum insulated vessels for the on-board storage of liquefied natural gas as a fuel for automotive vehicles.

13. New Provisions for specific LNG components will be added to a New Annex 3 to R.110. Wherever possible amendment language developed for R.110 was modeled on other existing LNG standards (i.e. Society of Automotive Engineers [SAE] or the U.S. National Fire Prevention Association [NFPA] Standard 52). This reflects the goal of harmonizing with other standards and to speed the development and adoption of R.110 LNG amendments.
14. In-tank pump requirements. Westport lead a discussion on specific conditions and regulatory language related to LNG in-tank pumps. Regulation 67 was used as a 'main frame' along with other documents with references to pumps in order to synthesize the requirements for the recommended amendments to R.110.
15. Holding time requirements. There has been much discussion about LNG holding time, boil-off, and venting within both the LNG-TF and the Heavy Duty Dual-Fuel Task Force. Concerns have been expressed about both safety as well as the unwanted escape of methane into the atmosphere. Keeping in line with the goal of harmonization and streamlining this amendment process, language and definitions on 'holding time' were taken directly from SAE J2343 to form the basis of the newly recommended amendments to R.110 on this subject.
16. Anticipated progress of the LNG TF. The Chairman will attempt to prepare an informal document for the next meeting of the Group of Experts on General Safety (GRSG), which meets 16-20 April 2012 at the UN in Geneva. A formal document might be available for the GRSG by 2-5 October 2012 and, if approved could go to the WP29 for final approval in the first meeting of 2013. Next meeting of the LNG TF is called for 21st March 2012 in Brussels.
17. Mr. Rijnders indicates that all assigned Contracting Parties (CP) of R110 must be involved in the development of these new amendments into R110 to ensure that they are including the EU and that they are comfortable with the changes. In particular all contracting parties must agree that LNG will be a part of R110. Furthermore they have to find the use of the SAE standards as a 'model' as appropriate and acceptable. This is a GFV recommendation from an environmental and safety standpoint. (In consideration of the venting/boil-off in particular, GFV may want to discuss these issues.)

VI. Co-decision on THC emissions regulation, Directive 715/2007. Input for revision of the THC and methane emission limits

18. Mr. Rijnders described the background to the issue of methane in European regulations. The THC limit values (in addition to the NMHC) require NGV system suppliers (OEMs and retrofits) to add expensive catalysts. Also the European regulations are not in conformance to US or Japanese methane regulations. In Europe the issue was only dealt with in 1999 for heavy duty vehicles in the context of the development of the Environmentally Enhanced Vehicle discussion. At that time the THC was changed into a NMHC and a CH4 value for natural gas HD engines and vehicles, but not for LDVs. The topic again has been tabled at the GFV, to argue that methane should not be part of the pollutant emissions. The standards on their own (UNECE) could not be changed without

conformity to the EU regulations, which would require Council and European Parliament decision. The Commission is now taking on board in their 2012-2013 working program, which includes a proposal under the legislative procedure for complimentary provisions for Euro 6, to facilitate type approval of NGVs. There will be a co-decision document to give the mandate to the Commission to revise the THC emission regulations for gas vehicles. The Commission has requested Mr. Rijnders, as Chair of GFV to give input on this topic and make a proposal as to how best to incorporate changes into the European legislation.

19. Mr. Rijnders described the suggested 'two step' approach: to make the LDV regulation in line with the HDV, using the same general ratios of NMHC to other emissions. Step one would include creating a methane 'cap'. A second step, something for future consideration of the European Commission, would be to include methane into other regulations dealing with CO2 and greenhouse gas emissions. Step two suggests that if methane is regulated separately as a global warming gas then the methane cap should be removed.
20. The draft CHF position paper that was requested of the GFV by the European Commission to support their was sent only one day before the GFV meeting so there has not been substantial time to consider it and make a response. Mr. Rijnders asks if anyone has any general or specific remarks on the document or on the issue and a broad and general discussion followed (see directly below).
21. Ms. Leifheit (Volkswagen). The higher price of catalysts is not an argument for implementing the legislation. The penalty for the CO2 legislation is more important an issue for the auto industry than the savings on the cost of methane catalysts. There remain many consequences in step 2 for the OEMs. She also noted that any retrofit vehicles would not count toward the OEM fleet requirements to reduce CO2.
22. Mr. Rijnders pointed out that OEM NGVs will be a benefit to them in reducing their CO2 emissions. Furthermore, the second step is very political and will be a much more difficult discussion. But the GFV is not advocating this nor has any control over an action that is clearly in the hands of the political institutions.
23. Mr. Seisler (NGV Global) further elaborated that the two step approach satisfies both political concerns about continuing the regulation of methane emissions (via a cap to replace the THC) but does not include methane in the CO2/GWP 'basket' which would be a hardship for the OEMs who are concerned about every gram of CO2 reduction (or its equivalent). He also reminds the group that the EU legislation is incorporated into R.115, a global regulation, and this has a worldwide impact on the NGV industry, particularly in markets where OEMs are not substantially present but is driven by the retrofit industry.
24. Mr. Rijnders added that it seems beneficial to harmonize the methane requirements of LDV regulations with the HDV regulatoins.
25. Mr. May (AECC) suggested that the 'cap' would be 7 times higher (THC = 100mg; NMHC = 68mg). Mr. Rijnders, however, states that the limit value is only doubled. Mr. Rijnders reminded the group of the discussion in 1999 at the Motor Vehicle Emissions Group (MVEG) that the NMHC and CH4 (300 mg/km) was in general already accepted by the ACEA and all member states (at that time) but the LDV CH4 limit was brought into question at the last moment by one Member state due to one manufacturer's statement that they could achieve the THC of 100 mg/km with a CNG vehicle. But the fundamental discussion of methane was not done at that time..
26. There was a give-and-take discussion between VW, TNO, Mr. Rijnders, and Mr. Seisler about why there can be a limit on methane, even if it's not a pollutant, but as a green house gas (GHG). It is agreed that the OEMs have strong opinions about not adding new elements in the 'basket' of global warming gases. But there is another issue for

OEMs who claim that they are subject to a more stringent level of emissions regulations than the NGV retrofitters who must comply with R.115, seen as a less rigorous regulation. Mr. Rijnders suggests that regulators must look at the fairness of the pollutants being discussed, either as a pollutant or as a green house gas.

27. Mr. Piccolo (AEGPL) indicates that there is a CO2 benefit or opportunity to have a CNG car counted in the CO2 regulations.
28. Mr. Rijnders apologies that the document (GFV 18-06 CH4 Position Paper) was sent late to the GVF and that the discussion should be continued at the next GFV meeting. He asks the members for suggestions and comments on the text and tables
29. Mr. Renaudin reminds the group that a small group in the GFV have made this proposal and the HDV manufactures did not have time to consider and discuss the document with other members of the International Association of Automobile Manufacturers OICA, who will be concerned about methane regulation. He suggests that this document is not a GFV document.
30. Mr. Rijnders reminded Mr. Renaudin that he, the GFV Chairman is responding to a request from DG Enterprise. Mr. Rijnders indicates that this is a working document for further discussion and does not necessarily have a consensus on the subject. Mr. Rijnders will provide the request from Mr. Steininger (from the Commission) to the GFV Chairman to deal with this issue. He assures the group that the document would not go to the Commission unless there is some agreement on the content of the document. This is not a 'normally' submitted document as other GFV documents since it was motivated as a specific request from the Commission.
31. Mr. Piccolo suggests that the motivation for creating this document should be clear in the document (and not just in the meeting minutes) either through the use of the standard template for submitting documents or another technique that includes the request from the Commission to create the CH4 rationale.

VII. HDDF Informal document R49-Euro VI and the additional text needed for the formal document to be submitted to the 64th GRPE (June 2012)

32. Mr. Rijnders explains that the HDDF document still has remaining issues that cannot be resolved by today in order to supply a formal document in time for the June session of the GRPE (formal documents must be submitted by 9 March for consideration). Another meeting on Thursday 8th March 2012 of HDDF TF and GFV will be held at the RDW in the Netherlands. HDDF TF will meet in the morning; the GFV will meet in the afternoon but the only discussion item will be HDDF issues. A complete formal document with annexes will not be available by the 9th March so a formal document will be submitted including a 'reservation' for the Annexes that still are under discussion within the HDDF TF and GFV. The Formal document will be launched on the UNECE website for people to review. Then the annexes can be provided as an 'informal document' that can be voted by the GFV at the June meeting in Geneva (in advance of the GRPE) to become part of the formal document.
33. Mr. Crawford asks if a teleconference capability will be available. Mr. Rijnders indicates that they have the capability to do this and will try and organize a call-in facility.

VIII. Development of Formal Documents for R. 83 and R. 115-GFV (Mr. Piccolo, AEGPL) (Based on Informal GRPE-63-05 (R.83) and Informal GRPE-63-06 (R.115))

34. Mr. Piccolo reminds the group that Mr. Radzimirski (Poland), in the GRPE January session and in subsequent documents circulated to the group, made two main remarks:
    - As for R.115 proposed amendments, several retrofit system manufacturers find it difficult to meet the emission limit in R.115 because of a certain incapacity to correctly calibrate the engine on gas or, for example, on CNG because of the ineffectiveness of the catalyst. If the possibility to use petrol up to 20% in energy unit

was accepted, it would be possible for such manufacturers to extend the operation with petrol in the gas mode after the cold start for some 200 – 250 seconds in a Type I test, in order to satisfy the requirements. As for petrol direct injection engines, that would not be possible since petrol use is mainly required in the second part of the cycle. Mr. Radzimirski proposes, therefore, to limit this provision only to vehicles with direct injection petrol engines.

- As for both proposed amendments to R.115 and R. 83, the proposed method for gas ratio calculation (Annex 6B) does not seem to be suitable for reference CNG fuel G25 that is composed of 86% mole of methane and 14% mole of nitrogen (average percentage). The measured CNG mass consumed during the cycle by fuel weighing (numerator of the gas energy ratio) would correspond to the total mass of methane and nitrogen, while the denominator would estimate only the equivalent mass of methane consumed during the cycle. In the case of G 25 reference gas, the calculated gas energy ratio would, therefore, be higher than the actual one. Therefore, the method for G25 needs correcting via, for example, a correction coefficient.

35. As for the first remark, Mr Piccolo stated that AEGPL shared the concern of Mr Radzimirski and, in principle, would keep the two regulations aligned. However, if the group agrees such a “decoupling” of the two proposals making R.115 more restrictive in comparison with R 83, AEGPL would not oppose it.
36. Regarding Mr Radzimirski’s second remark, AEGPL asks the group and, in particular, NGVA Europe to specify some correction factors to the gas energy ratio in the case of testing with G25.
37. Mr. Del Alamo (NGVA Europe) indicated that Fiat does not see the necessity of the amendment to R 83.
38. Mr. Tappe (CLEPA/Bosch) suggested to leave to the discretion of the OEM’s the opportunity to use the two fuels, gas and petrol, in the most synergistic way for any type of engine system, be it a PSI or GDI. This is in line with a request for more flexibility made by OEM suppliers. OEMs, to respect the CO2 obligations, are forced to minimize the use of petrol and have no reason to misuse of petrol to fulfil the emission limits in the gas mode. That said, due to some safety concerns about the gas mass measurement by weighing, Mr Tappe asked the group to evaluate a different method based on petrol and gas ECU’s data, validated by a proper initial comparison with the official results coming from the application of FC (carbon balance) formulae.
39. Mr. Castagnini (AEB) expressed concern that a change of this type would delay submitting the formal document. Hence, he suggests to add the new method proposed by CLEPA as an alternative.
40. My Rijnders, taking into account the positions of the members, proposed to convert the present R.83 proposal (GRPE-63-05-Rev.1) into a formal document for the next GRPE session with no modifications. As for the R.115 proposal, the formal document based on the informal GRPE-63-06-Rev.1 will reflect the comment received by the Polish expert, in restricting the scope of the provision related to the 80% minimum limit for gas energy ratio only to vehicles with petrol direct injection engines. In addition, Mr. Rijnders asked Mr Tappe to provide an appropriate text containing provisions for an alternative method to weighing the mass of gas. This could possibly be included in an informal document to be submitted to the June 2012 GRPE by GFV.
41. Furthermore, it is agreed that an adequate correction factor for G25 will be part of an informal document for the next GRPE session.
42. The group agrees and provide for a consistent revision of GRPE-63-06-Rev.1.

IX. Next meeting GFV-20 in Bologna, hosted by Landi-Renzo/AEB.

43. Meeting for GFV on 14 May to Bologna to start at 14.00. On 15 May there will be a morning meeting (start 08.30) and following the meeting (early afternoon) the group will visit the Landi-Renzo facility. Mr. Castagnini will assist the secretariat (Mr. Seisler) to make logistical arrangements and communications for the GFV members and interested parties

X. Summary (Mr. Rijnders);

- Change in R.115 adopted and brought to Geneva as a formal document
- Agree on R.83 without change (Formal Doc 64th GRPE based on GRPE-63-05_rev1 (R 83)
- Definitions of WLTP: the modified document (GFV-18-02) will be sent to Bill Coleman and Stefan Redman for WLTP.
- Methane emissions (THC/NMHC)has been discussed but this will be continued in Bologna at the next GFV meeting in order to incorporate and review comments and input from stakeholders
- 8th March will have morning meeting of Dual Fuel and afternoon GFV with the possibility of a teleconference at RDW offices in the Netherlands.
- Next GFV meeting in Bologna on 14th April 2012 will start at 14.00 and will continue on the 15th May going to approximately 13.00 followed by a visit to Landi Renzo.

Attendees

Andre Rijnders (RDW, NL)
Henk Dekker (TNO)
Jean-François Renaudin (Volvo)
Jeff Seisler (NGV Global/Clean Fuels Consulting)
Joseph Gillingwater, (Hardstaff Group)
John Crawford (Westport)
John May (AECC)
Mario Mannlein (Dual Fuel Diesel GmbH)
Susanne Leifheit (VW)
Ralf Kleebusch (TUV)
Francesco Cagnolati (Landi Renzo)
Alberto Castagnini (AEB)
Salvatore Piccolo (Federchimica/AEGPL)
Afternoon additional attendees:
Trevor Fletcher (Hardstaff Group)
Jaime Del Alamo (NGVA Europe)
Matthias Tappe (Bosch/CLEPA)