LNG-TF-06-04

Meeting Minutes
LNG TASK FORCE
Meeting 6
2 JULY 2012 10.00 – 17.30
3 JULY 2012 8:30 – 14.00
Brussels
(Eurogas/NGVA Europe Offices)
Ave. de Cortenbergh 172
1000 Brussels

I. Welcome & introduction of the members
   1. Chairman Dijkhof welcomed the in-room attendees and the phone-in attendees as they joined the discussion.

II. Approval of the minutes of the previous meeting (Document LNG-TF-05-03)
   2. The minutes are approved as there are no changes requested or comments.

III. Approval of the agenda for the 2 day's meetings (Document LNG-TF-06-01)
   3. Discussion about approach today: finish the Annex 4 and then go to the top of the document or vice versa

IV. Review of the current work: Editorial review and changes to the entire document were done on a line-by-line basis. Some of the specific items that were raised in discussions are highlighted below. (Specific changes to the document can be found in detail in Document LNG-TF-04-02 modified 30-05-2012 v4, used as the basis for today's discussion.)
   4. **Annex 4J**. Provisions regarding the approval of LNG filling receptacle. Since there are two versions of the LNG receptacles the intension at this time is to keep references as vague as possible to include all possible versions. As soon as the ISO comittee has a good description for the LNG receptacle we need to update the regulation by including the reference to these parts of ISO, as was done for the CNG receptacles.
   5. Question about spillage of 10ccs LNG; 10ccs are claimed to be too few but 15 may be enough. (Mr. Murray, Chart). Decision made is to follow 7 February 2012 version of ISO at 30cm.
   6. Material of the fuel receptacle should be made of non-spark material. Reference will be made to procedures in ISO 14469/Part 1 or Part 2 depending on which size or sizes of receptacle is referenced (as in item IV.4, above).
   7. **Annex 4K. Testing of pressure regulator**. Question is whether to specify the durability test temperature, either ambient or cryogenic temperature. Decision is made to use cryogenic temperature according to Annex 5L, Durability Test. But the following exceptions are mentioned: the number of test cycles should be 7000 cycles (at the low temperature cycle); the components shall be connected to a source of pressurized cryogenic fluid; and that the components shall be operated to 2 percent of the total cycles at the appropriate minimum temperature (-40$^{o}$C or -20$^{o}$C) connected to a source of pressurized cryogenic fluid.
   8. **Annex 4L. LNG Pressure & Temperature Sensor.** Discussion about 3.2 insulation resistance test is left as indicated in the corrected text: 10MΩ. In addition, the same text is added from the pressure regulator regarding cycle testing from Annex 5L, along with the exceptions.

9. **Annex 4M. Provisions for the approval of the natural gas detector.** These are left as they are for CNG, with provisions 5D of this document. The natural gas detector shall comply with the electromagnetic compatibility in the existing Regulation No.10.03 series.
10. **Annex 4N. Provisions regarding the approval of the automatic valve, non-return valve, the pressure relief valve, pressure relief device and the excess flow valve only for LNG applications.** Changed test pressure to 1.5 instead of 2.5.
11. Section 3.2.3. Cycling changed from 20,000 to 7,000 to conform with previous changes of the same nature (since L-NGVs do not refuel as frequently as CNG vehicles). Testing pressure also is specified at 1.5 times the working pressure, consistent with CNG.
12. Section 4: Pressure relief valve (and also included is the pressure relief device-PRD). Reference to the PRD can be removed because this is not included in LNG equipment. Language related to the pressure relief *valve* is removed and related remaining language is amended as appropriate.
13. Section 5: LNG Excess Flow Valve. Text added as 'external' leak-proof.
14. Section 5.2.1. Text removed 'if it is not mounted internal to the tank', which is not applicable for LNG. Changed to 'if it is not mounted in the tank.'
15. Section 5.3: excess flow valve shall be designed to be leak-proof is changed as 'shall be designed with a bypass (internal leak) to allow for equalization of pressures.'
16. Section 5.4: section is removed (excess flow valve designed with a bypass to allow for equalization of pressures' is no longer appropriate). New text is added to new 5.4.
17. Section 10.2.1 and 10.2.2 moved to new section 5.4 and remove references to 'air testing.' Also specified that testing must be with water. Section 10.2.8 is moved into Section 5.4 (new 5.4.2) describing in more detail the test. Specifications are made in kilograms.
18. Section 5.5. 'When the LNG excess flow valve is in the cut-off position, the by-pass flow through the valve shall not exceed an airflow rate declared by the manufacturer in cm3/min at service pressure.
19. Section 5.6. The device shall comply with the test procedures for the Class 5 components.
20. Section 6. Language regarding the LNG manual valve and new 6.3 section added, LNG manual valve device requirements. (see specific document language for details).
21. Section 6.3. LNF manual device requirements: Number of cycles of testing are discussed (100); One specimen shall be submitted to a fatigue test at a pressure cycling rate not to exceed 4 cycles per minute: (with the test held at -162$^{o}$C or lower while pressured for 100 cycles between 0 and SP. The maximum torque on the valve shall then comply with table 5.3 in Annex 5L. After the test the LNG manual valve shall comply with the external leak test in Annex 5B.
22. New section 6.4: The materials constituting the LNG manual valve that are in contact with the LNG when operating shall be compatible with the test LNG. In order to verify this compatibility the procedure described in Annex 5D shall be used.
23. Section 7: LNG pressure relief device (pressure triggered). Language removed as not appropriate.
24. **Annex 4P (New) LNG Fuel Line and fittings.**(hydrostatic strength; bending). There is a discussion about the need to have better regulation for stainless steel piping for CNG and LNG. But the mandate for this TF now is for LNG and any upgrading of R.110 for CNG piping would not necessarily be appropriate now since the manufacturers (and OEMs) generally are not present. Decision is made not to deal with steel lines now and await further amendments in the future.

    **Review of Editorial changes Annex 5**
25. The participants went through the document line-by-line as determined appropriate for editorial purposes.

**Review of Editorial changes complete document:** The participants went through the document line-by-line also incorporating almost all the changes indicated by Ashok Leyland in their comprehensive review of the amendments (See document LNG TF-06-03), This review included checking cross references, footnote numbering, and indicating consistency

26. Section 6 and (new) 18.1.8: Vehicle marking and labelling. Vehicle labelling requirements were distinguished between the vehicle and the fuelling requirements, Decision made to leave fuelling requirements to the manufacturer as it is a function of fuelling and not of the vehicle. Other labeling requirements were previously discussed.
27. **Section 18.3.4.** LNG components. Discussion of the 'shall contain' gas leak detection device. Since LNG is not odorized this was an issue. The point was made by Mssrs. Murray and Whitehouse that these systems are unreliable (detecting things other than gas) and also tend to drain the batteries on vehicles left overnight, hence they tend to be disconnected by the operators. Decision is made not to make leak detection mandatory but optional to the manufacturer and/or user.
28. **Section 18.3.6.** Discussion that some components on LNG vehicles are CNG components, and whether these should be identified as distinct. This should be clear for type approval of the required components on the vehicle. As such, the sentence added as 'LNG vehicle components of (gaseous phase) downstream of the heat exchanger/vaporizer shall be considered as CNG components. The CNG components shall include items referenced in the section on CNG components.
29. **Section 18.7.7** as for CNG cylinders, byte-type compression joints are not permitted for LNG tanks. Nevertheless, two-part compression joints are allowed.
30. The Chairman asks to receive any and all comments from the participants and stakeholders in preparation for the final draft document to be submitted as a Formal document on 6th July.

V. Any other business: None
VI. Next meeting: None noted at this time, pending outcome of GRSG meeting in October 2012.
VII. Meeting Close

**Attendees**
Paul Dijkhof, Chairman (KIWA)
Jeff Seisler (NGV Global/Clean Fuels Consulting)
Jaime del Alamo (NGVA Europe)
Peter Murray (Chart)
José Luis Pérez Souto (IVECO)
Andrew Whitehouse (Clean Air Power)
**Call in participants**
Ravi Muthachari (Ashok Leyland)
S.Yoganandam (Ashok Leyland)
Jean Louis Chazalette (Volvo)
Nathanael Crut (Volvo)