

Meeting Minutes  
LNG TASK FORCE – 14  
TELECONFERENCE  
27 November 2013  
16.00-18.00 CET

- I. **Welcome and review Agenda and Meeting minutes** from 12<sup>th</sup> November meeting (LNG-13)
  1. No comments or changes on the meeting minutes form LNG TF-13.
  2. Review of the agenda for today's meeting. No further items added
- II. **Open Topics from TUV: temperature downstream from the vaporizer (LNG)**
  3. Suggestions provided by Brenda Smith on LNG and CNG downstream from the vaporizer: temperatures for LNG and pressure for CNG. This all is addressed in this definition. Mr. Dijkhof asked if there are suggested changes to this wording.
  4. 18.14 wording now is: "A safety system shall be provided so components downstream of the regulator shall not be exposed to pressures higher than designed. For a vehicle operating on LNG a further safety system shall be provided so that components downstream from the vaporizer shall not be exposed to temperatures lower than designed."
  5. The wording is made consistent with other clauses regarding 'provided' versus 'designed'.
- III. **Height of LNG tank mounted on the truck.**
  6. Scania proposed to eliminate the 200mm minimum ground clearance of the LNG tank because the clearance requirement limits the maximum fuel capacity, and therefore the attainable driving range. LNG tanks consist of outer and inner tank with insulation in between and this helps prevent leakage. Also, it is easy to do a visual inspection of an LNG tank (unlike CNG tanks with fiber coating).
  7. Mr. Whitehouse (CAP) provided some suggested changes that maintain the 200mm minimum ground clearance but also takes into consideration a future design of tanks without a double skin and could cover a CNG tank as well. His suggested Section 18.4.3 would then read: "When the vehicle is ready for use the fuel container and/or tank shall not be less than 200 mm above the road surface *and the container shall not touch the ground if any tire or tires are deflated.*" Then, to further address Scania's concern another section would be added as 18.4.3.2.
  8. 18.4.3.2. could be added so that, "For a double skinned, insulated LNG tank, if the inner vessel is adequately protected by the outer vessel at the front and the sides and no part of the inner vessel is located lower than this protective structure, the provisions of paragraph 18.4.3 shall not apply."
  9. Still, in section 18.4.3.1 the language leaves it to the manufacturer to persuade the Type Approval Inspector what "adequately protected" means, so the same could apply to LNG tanks. This would prevent tanks with very light outer vessels being approved, but still allow some flexibility.
  10. The proposal from Mr. Whitehouse seems to address Scania's their concern and is acceptable.
  11. Mr. Whitehouse also provided wording appropriate for a possible 18.4.3.3 addressing low floor buses ('kneeling' buses): "Where the vehicle has "kneeling"

or variable suspension height, the fuel tank shall not touch the ground in the kneeling or lowest suspension position. The tank shall be adequately protected from grounding in the kneeling or lowest suspension position in event of puncture.”

12. The word ‘puncture’ is debated, and should be changed to ‘flat tire’ to cover all types of tire destruction leading to a ‘flat tire.’
13. There is discussion about ‘variable suspension’ vehicles (as opposed to kneeling buses) and whether the container (CNG) or tank (LNG) should be specified as being protected at the *lowest* part of the container/tank from the ground. The solution in 18.4.3.3 is to specify buses (M3), also that have kneeling or variable suspension height the tank shall not touch the ground in the event of a flat tyre. Finally, the use of ‘flat tyre’ is omitted.
14. Final language for three sections are as follows:
  - 18.4.3. When the vehicle is ready for use the fuel container and/or tank shall not be less than 200 mm above the road surface **and the container and/or tank shall not touch the ground if any tyre or tyres are deflated.**
  - 18.4.3.2. For a double skinned, insulated LNG tank, if the inner vessel is adequately protected by the outer vessel at the front and the sides and no part of the inner vessel is located lower than this protective structure, the provisions of paragraph 18.4.3. shall not apply.
  - 18.4.3.3. For vehicles that have “kneeling” or variable suspension height, the fuel cylinder and/or tank shall not touch the ground in the kneeling or lowest suspension position.
  - Section 18.4.3.1 leaves it to the manufacturer to persuade the Type Approval Inspector what “adequately protected” means, so the same could apply to LNG tanks. This would prevent tanks with very light outer vessels being approved, but still allow some flexibility.

#### IV. **ADR tank leakage provision (9.2.4.3)**

15. The original language that would prevent LNG from being used as a vehicle fuel says, “In the event of any leakage the fuel shall drain to the ground without coming into contact with the hot part of the vehicle or the load.” There was some concern that this wording would imply that that leaking fuel would not come into contact with any part of the load, as opposed to just ‘hot parts’ of the load. The suggested language, therefore is: “...without coming into contact with the hot part of the vehicle or the hot part of the load.”
16. There is discussion about just adding the word ‘dispersing’ (to go along with ‘draining’), which is generally agreed by the participants. But there is a discussion if the notion of ‘dispersing gas’ would lead to questions about gas coming into contact with a ‘hot part’ of the engine or, for example the exhaust pipe, and igniting. None of these parts/areas are, however, reaching the methane ignition temperature.
17. New language is suggested, but with a question as to whether ‘ignition temperature should be included, as: “(a) In the event of any leakage *in the normal operating conditions of the vehicle*, the fuel shall drain to the ground or *disperse* without coming into contact with hot parts [*above the auto ignition temperature*] of the vehicle or the load.”
18. Following from the idea of gas ‘dispersed’ there is a discussion as to whether a definition of methane or LNG/CNG would be required in Annex A, section 1.2.

There already is a definition of methane in the section dealing with the carriage fuel (methane is reference number 1971 and LNG is reference number 1972).

19. The next question is whether a new definition of LNG (or gaseous fuel) as a *propulsion* fuel in the truck is required.
20. LNG TF members will have to inquire with their national members of the ADR to see if the suggested language we have designed is acceptable to some of the national expert. We will need a single document that explains what we have done as LNG TF and circulate it to some of the ADR members to see if the language will be acceptable.

**IV. Other issue: Gas detector on board.**

21. Mr. Whitehouse asks if R.110 needs to describe/define a *gas detector* (category N3, and maybe in the ADR). Mr. Dijkhof says that gas detector is defined for category M vehicles. R.110 says gas detectors are optional. Another option for an amendment to R.110 would make gas detectors mandatory for ADR vehicles. This can be discussed in future.

**V. Date for the next meeting/teleconference**

22. The next teleconference will be held on December 16, 16.00-18.00 Central Europe Time (CET). Mssrs. Dijkhof and Seisler will inform the LNG-TF about call-in logistics and agenda.

**Attendees**

Paul Dijkhof, Chairman (KIWA)  
Jeff Seisler, Co-secretariat (NGV Global/Clean Fuels Consulting)  
Mihai Ursan (Westport)  
Andrew Whitehouse (Clean Air Power)  
Jean-Louis Chazlette (Volvo)  
Johan Hag (Scania)  
Peter Murray (Chart industries)