

## **Invitation for GRSG experts for a meeting on LNG equipment standards in Regulation No. 110**

The Informal Group on Gaseous Fuelled Vehicles (GFV) (within the Group of Experts on Pollution and Energy –GRPE) is planning a special one-day meeting on 16 May 2011 from 10.00-17.00 in Brussels at the DG Enterprise Brey Building to focus specifically on liquefied natural gas (LNG) fuel tanks (but related LNG items are anticipated in the discussion). Members of the Group of Experts on General Safety (GRSG), as well as ISO LNG experts are invited to attend this informative session so that we may be better prepared to address the LNG issues that will arise very shortly in conjunction with the work on dual-fuel systems being done by the GFV.

### **Background**

The GFV is actively concerned about the emissions-related issues for gas vehicles operation (CNG and LPG). The GFV group is, for one year now, in the process of developing certification procedures for heavy duty natural gas and LPG dual-fuel engines and vehicles. A Heavy Duty Dual-Fuel Task Force (HDDF) has been created within the GFV group to deal specifically with the issues associated with dual-fuel (D-F) engines.

“A dual-fuel engine means an engine that uses simultaneously two different types of fuels supplied from separate on-board storage systems and where the consumed amount of one of the fuels versus the other one may vary depending on the operation.” (UNECE-GFV-HDDF-02) There are a variety of dual-fuel engine types, including those that operate on compressed natural gas, liquefied natural gas (LNG), and LPG.

The main focus of the HDDF task force is to adapt emission legislation and procedures to enable type approval of dual-fuel engines/vehicles. The work of the HDDF and GFV is targeted to request the GRPE in June 2012 for approval of the amendments to UNECE-R49 and for the WP29 to follow in November 2012 with approval of the amendments to UNECE-R49.

### **The Challenge Regarding Regulation 110**

The heavy duty vehicle manufacturers that are interesting in this new D-F technology include work on a liquefied natural gas application, which also must have an on-board LNG storage system. Thus, the attempt is to align the timetable for completing certification procedures for heavy duty LNG vehicle tanks (and possibly fuel connectors) with the amended emissions regulations for dual-fuel engines (to best extent possible). Thus, the HDDF Task Force would like to encourage the GRSG to start the LNG certification requirements within R.110 as soon as possible.

The complication and challenge is, however, that LNG standards now in progress at the International Standards Organization (ISO) are not yet complete. Although GRSG cannot, at this time, incorporate LNG standards for such components as fuel tanks and fuelling connectors, it should be possible to identify where in R.110 these elements will be included and, to the best extent possible, prepare a series of draft amendments (or ‘reservations’ for amendments) to accommodate the LNG systems into R.110. Additionally, the GRSG could help the LNG experts from ISO in their process to complete the ISO standards as quickly as possible.

## **Advancing the LNG Knowledge Base**

Recognizing that expertise on LNG vehicle components needs to be established, the HDDF Task Force is planning a special one-day meeting on 16 May 2011 from 10.00-17.00 in Brussels at the DG Enterprise Brey Building to focus specifically on LNG fuel tanks (but related LNG items are anticipated in the discussion). The HDDF Task Force invites and encourages members of the GRSG, as well as ISO LNG experts to attend this informative session so that we may be better prepared to address the LNG issues that will arise very shortly.

### **Current ISO work and existing standards on L-NGV (liquefied natural gas vehicle) equipment standards (Provided by NGVA Europe)**

This standard is supposed to group all the existing technical related aspects regarding LNG tanks: **ISO/CD 12991**: Liquefied natural gas – Transportable tanks for use on board vehicles. Target date: 12-06-2013. Stage 30.60 (close of voting/comment period).

#### **Ongoing developments (connected but not specifically related to the tank):**

**ISO/WD 12614**: Liquefied natural gas fuel system components. Stage 10.99 (new project approved).

**ISO/WD 12617**: Liquefied natural gas vehicles. Connector for refuelling vehicles. Stage 20.99 (WD approved for registration as CD).

#### **Existing LNG system standards**

**ISO 21014:2006**: Cryogenic vessels – Cryogenic insulation performance. Stage: international standard confirmed. Abstract: defines practical methods for determining the heat-leak performance of cryogenic vessels. The methods include measurement on both open and closed systems. It neither specifies the requirement levels for insulation performance nor when the defined methods should be applied. These requirements may be defined in design or operational standards/regulations.

**ISO 21009:2006/2008**: Cryogenic vessels – Static vacuum insulated vessels. Stage: international standard to be revised.

Part 1: specifies requirements for the design, fabrication, inspection and testing of static vacuum-insulated cryogenic vessels designed for a maximum allowable pressure of more than 0,5 bar.

Part 2: specifies operational requirements for static vacuum insulated vessels designed for a maximum allowable pressure of more than 0,5 bar (50 kPa). It may also be used as a guideline for vessels designed for a maximum allowable pressure of less than 0,5 bar (50 kPa).

#### **Existing European Norms for LNG tankage**

**EN 1251 (2000)**: Cryogenic vessels - Transportable vacuum insulated vessels of not more than 1000 litres volume.

Part 1: fundamental requirements.

Part 2: design, fabrication, inspection and testing.

Part 3: operational requirements.