

# **LNG TASK FORCE**

## **PROGRESS AS OF 3 NOVEMBER 2011**

# **REPORT TO THE GFV**

## **NGV Global**

**(presented by: Jeff Seisler)**

**15 December 2011**

**Brussels**



# LNG Task Force Summary

3 November 2011

- Chairman
  - Paul Dijkhof (KIWA)
  - Co-Secretariat: Jeff Seisler (NGV Global)
  - Co-Secretariat: Jamie Del Alamo (NGVA Europe)
- Participants
  - Chart Industries
  - Westport
  - Clean Air Power
  - Daimler
  - Volvo
  - Iveco
  - Idiada

# LNG Task Force Summary

3 November 2011

## KEY ISSUES

- Chairman proposed template for input of new information and amendments
- Basic work of the TF was going through R.110 line-by-line, making editorial changes as appropriate (adding 'LNG' next to CNG)
- Discussing other 'key' issues
  - Change in text
  - Too complicated: deal with later
  - Put into LNG Annex

# LNG Task Force Summary

3 November 2011

## KEY ISSUES: Components vs systems

- General discussion about the need for detailed regulations, component-by-component or whether to be more generic.
  - Some countries in Europe take the approach that components must be specified or the system, without a component specified, might not be homologated.
  - Decision: deal with 'multi-functional' aspects of systems but, where needed, new annexes for specific systems can be added as determined necessary.

# LNG Task Force Summary

3 November 2011

## KEY ISSUES: LNG 'Boil Off'

- The LNG Task Force was asked by the Informal Group on Gaseous Fuel Vehicles and the Heavy Duty Dual-Fuel Task Force to consider issues associated with LNG boil-off and venting into the atmosphere.
- This is due to the concerns of the European Commission about emissions of methane from L-NGVs (and throughout the value chain of the entire system).
- Westport provided a PowerPoint presentation on 'What is Boil-off?' (Document LNG TF-02-05).

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## What is boil-off?

- A cryogenic fluid is typically kept at low temperatures in a storage vessel. The storage has a major challenge due to the inherent heat input from the environment.
- The effect of the heat input is warming of the cryogenic fluid:
  - If (constant volume) → Pressure increase in the storage vessel
  - If (constant pressure) → Fluid boils and “boil-off” vapours are released from the vessel (venting)
- ***The vapours created due to the ambient heat input (while maintaining constant pressure in the storage vessel) are called “boil-off”.***
  - ***The discharge of these vapours out of the storage container is called venting.***

# LNG Task Force Summary

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## Boil Off: LNG Tanks

- **Boil-off for the vehicle LNG Tank**
  - LNG is a cryogenic liquid stored in a tank on-board the vehicle. Inherently heat from ambient flows in and warms the liquid.
  - For this application, the tanks are designed to take higher pressure, therefore being able to contain the LNG without release of vapour.
  - The time the tank can hold the LNG without venting is called “holding time”. By codes in US and Canada the holding time is 5 days.

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# LNG Task Force Summary

3 November 2011

## Conclusions: Boil Off

- The use of LNG has the inherent time factor, due to the heat input from the ambient to the vehicle tank.
- As required by codes in US and Canada, the LNG vehicle tanks are designed to contain the LNG for 5 days without venting.
- For normal operation, there is no release of natural gas to atmosphere.



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## Conclusions: Boil Off

- Vapour transfer to fuelling station or on-board processing of vapours reduces the tank pressure and resets the clock on holding time.
- Best practice and experience is the key to successful operation.
- To avoid a dangerous condition, due to pressure increase above the maximum operating limit, the LNG tank will vent to atmosphere a limited amount of gas.

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## KEY ISSUES: Vehicle Labeling

- A discussion about vehicle labeling identifies different practices in North America and Europe. North Americans tend to identify alternative fuel vehicles to assist fire-fighters in knowing what fuel is used in a vehicle.
- In Europe, OEMs do not want to label passenger cars in such a manner but are more flexible about commercial and heavy duty vehicles.
- No firm decision is made at this time about regulatory language for vehicle labeling.

# LNG Task Force Summary

3 November 2011

## KEY ISSUES: Amend R.110 vs new regulation

- Initially debated: Create a new LNG regulation or amend (extensively) R.110
- Decision to amend R.110
  - Seen as faster than developing new regulation
  - Eliminates need to repeat (reference?) R.110 elements in new regulation
- Debate will be re-ignited by information provided by Secretariat of GRPE/GRSG

# LNG Task Force Summary

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## KEY ISSUES: Amend R.110 or new regulation

- **Restructure R.110** and its Annexes into the 2 parts CNG and LNG as a new series of amendments (time consuming efforts to be done, including transitional provisions etc.).
- However, the adoption process by WP.29 and AC.1 will be quicker through a new series of amendments to R.110 (if all C.P. can except).
- **A new draft Regulation** is easier to be prepared by the informal group and GRPE. Contracting Parties (C.P.) would be free to apply the new Regulation. As the final draft Regulation has to go through the European Union co-decision process, it will take about 2 years extra time period for the EU to have to mandate for voting in AC.1.