SGS 4 - 09

GTR-Development
for H2- and FC-Vehicles

a TÜV SÜD - opinion
Some Thoughts on

1. Approval

2. GTR-Development
1. Approval
One of the most important Rules in Safety Technology:

**Prevention is better than cure**
Some experiences in the last 5 years with CNG- and LPG-vehicles in Europe:

- 6 burst incidents (Saarland-CNG, Recklinghausen-LPG, Emmendingen-LPG, Speyer-LPG, Brescia-CNG, France-CNG)
- reasons: position of PRD, LPG-tank was filled at a CNG-station, missing PRD, failing solenoid valve, too small orifice of PRD-vent line

-3 crash incidents with LPG-vehicles (Rinteln, Dülmen, Thalwil-CH)
  No burst of containers
Design, Characteristics, Compatibility, Durability (Pressure, Temperature, Media, Acceleration, Ambient Conditions…)

I

II

System

III

IV

Component

Statistics, Reliability
Components, System, Design, Characteristics, Compatibility, Durability (Pressure, Temperature, Media, Acceleration, Ambient Conditions…)

System Safety, Component Testing

System Inspection

Component Testing
2. GTR-Development
DRAFT STRUCTURE of HFCV-GTR, SGS 3-10, dated 2008-05-15

I. Storage system provisions

II. Vehicle fuel system integrity provisions

III. Electric safety
Questions arised during GTR-Discussions:

I. Storage system provisions

1. Scope and Purpose
2. Application
3. Definitions
4. General Requirements
5. Performance Requirements
6. Test conditions and procedures
7. Annexes

- Components and system requirements?
- Which components? Container, valve, PRD, filling device?
- Protection against overpressure
- Potential ignition sources
- Mechanical protection, … Part I or II?
- Who is addressed? Component manufacturer or vehicle/system manufacturer?
- Functional safety/quality of ECUs?
- Documentation?
- Burst ratios, fire protection, …
Proposal: Part I: basic requirements for accident prevention for system and components

I. Storage system provisions

1. Scope and Purpose

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7. Annexes

System and component requirements
CGH2 and LH2
H2-system excluding propulsion s. or other consumers

System, e.g. mechanical, electrical, functional r.
Components, e.g. P, T, Material, Media, function, etc.

System, e.g. overpressure/temperature, leakage, ignition sources, single failure, monitoring, vehicle integration, shut off strategy
Components (container, valve, PRD, filling device)

Documentation system
Documentation components
II. Vehicle fuel system integrity provisions
1. Scope and Purpose
2. Application
3. Definitions
4. General Requirements
5. Requirements and test procedures - in-use
   5.1. Performance requirements
   5.2. Test conditions and procedures
6. Requirements and test procedures - post crash
   6.1. Performance requirements
   6.2. Test conditions and procedures
7. Annexes

OICA-Proposal?
Further requirements, e.g.
Visible inspection
Tightness test
III. Electric safety

1. Scope and Purpose
2. Application
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   5.1. Performance requirements
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6. Requirements and test procedures - post crash
   6.1. Performance requirements
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7. Annexes