

**Draft Minutes**

**3<sup>rd</sup> Meeting of the Hydrogen Fuel Cell Vehicle (HFCV)  
Subgroup on Safety (SGS)  
Washington, D.C.**

**13-16 May 2008**

Place: U.S. Department of Transportation  
National Highway Traffic Safety Administration (NHTSA)  
West Wing  
1200 New Jersey Ave, SE;  
Washington, DC 20590

POC: Martin Koubek; 202-366-4026  
Nha Nguyen; 202-366-6934  
Luke Johnson; 202-366-0154

Schedule: Tuesday, 13 9:00 – 17:00  
Wednesday, 14 9:00 – 12:00  
Thursday, 15 13:30 – 17:00  
Friday, 16 9:00 – 16:00

Electric Safety Group Meeting:  
Wednesday, 14 13:30 – 17:00  
Thursday, 15 9:00 – 12:00

**AGENDA**

1. Welcome and Introductions – Ms. Julie Abraham, Director of Policy, Fuel Economy and Consumer Programs, NHTSA's representative to WP.29 welcomed participants to the 3<sup>rd</sup> Meeting.

Introductions

The meeting participants represented governments of the contracting parties, international standard-setting organizations, manufacturers and their associations, research and academic entities, etc., namely, Japan (NTSEL), China, Sweden, Korea, KTI-Hungary, US (DOT, DOE, LANL), Canada, Germany, the European Commission (DG, JRC), JASIC, JARI, Toyota Europe, OICA (BMW, Daimler, GM, Honda, Nissan, Volvo), ISO, SAE, CSA, TUV, CATARC, KATRI, JAMA, Swagelok,

2. Practical Arrangements

2.1 Documents (Detailed list of 2<sup>nd</sup> meeting in Appendix of SGS-3-1)

3. Approvals

3.1 Minutes/decisions of the 2<sup>nd</sup> Meeting (SGS-2-10)

Comment from ISO: pertaining to page 3, second bullet, last sentence: want to be able to consider all test protocols – change will be made. Revision of SGS-2-10 will be posted.

#### 4. Reports of UN Activities

##### 4.1 144<sup>th</sup> Session of WP.29 (March 2008)

Clarification of electric safety issue.

Report on SGS activities by Mr. Albus at June WP29 meeting (24-27 June)

Approval for electric safety group Terms of Reference (TOR) will be requested

Some earlier uncertainty whether or not the Electric Safety Group is to work on revising ECE R.100 or GTR – clarification received that work is to be done in parallel on both items – updating R.100 and developing GTR.

#### 5. Reports of other activities (go through Action Item list and refer to the item number found in document SGS-2.7)

##### 5.1 National/Regional

US: NHTSA expects to award research contract at end of May: hydrogen leakage limits (HP and LP); fire safety of vehicles with hydrogen leaks; post-crash electric isolation

- Research in support of rulemaking related
- 4 months to start of projects
- 12-15 month timeframe for work

ACTION: NHTSA to provide short description of its research plan for hydrogen vehicles

Canada: task on localized fire issue (test procedures) for replacement/supplement of bonfire test. Should be finished soon, maybe within next two months, and Canada will present at next meeting.

Japan: At first, container issue was very difficult for the Government to discuss but now it is engaged in an ongoing discussion on the issue. Japan expects that it will continue participating in discussion of container requirements (technical aspects), but will determine how to deal with GTR issue in political discussion to be held in co-sponsor meeting. Request for an official decision from the co-sponsors on how to incorporate technical requirements into the GTR, as this affects the content of the GTR.

ACTION: Request that contracting parties report on how they intend to implement GTR in national regulatory framework, as it is important for vehicle developers.

China: working on 4 or 5 standards for HFCV. Two will be completed this year. Once GTR is completed, China will consider adopting it. Recently, meeting was held to discuss how to put HFCV into use – what are the regulatory requirements needed. This is an urgent matter for China since it plans to deploy at least 3 HFC buses and 20 passenger HVC vehicles during the Summer Olympics.

European Commission - legislative process for type approval of hydrogen vehicle. URL for document is in the presentation. Co-decision regulation is likely to be adopted by the end of 2008. It has a similar structure to existing regulations for LPG and CNG vehicles. Comitology regulation is under development by the Commission and is planned for beginning 2009. More details will be provided at the next meeting. There is likely to be a reference to the GTR process in the EU Regulation language. Regulations are directly applicable, whereas Directives have to be adopted by member states. Focusing on the Regulation because it is thought that the regulation will be needed before the GTR is completed.

## 5.2 International

### 5.2.1 ISO - Refer to report in Section 7.2 (Containers).

### 5.2.2 SAE

J2579 Technical Information Report (hydrogen storage). Published in January 2008 as a TIR – it was developed over a period of 5 years, and is written in performance-based terms. System level performance code that is independent of storage system design. EOL burst margin, rather than BOL burst margin. Now in the two year period for evaluation and testing – the document then gets revised/published as a recommended practice. Validation testing at Powertech, which includes testing of two types of tanks at 70 MPa and tests for carbon-aluminum and glass-aluminum hydrogen tanks, should be completed in the next 2-3 months. Report will be shared. SAE J2579 should be considered for inclusion in the storage section of the GTR. Discussion on pressure testing (not many places can get to the high pressures (1200 bar) required). A comment was made encouraging a greater coordination among parties to avoid duplication of efforts.

ACTION: Report from Powertech to be provided as soon as possible (SAE).

### 5.2.3 International Partnership for Hydrogen Economy (IPHE) – Regulations, Codes and Standards (RCS) Working Group

Mr. Pietro Moretto (Joint Research Center (JRC of the European Commission), on behalf of Mr. Marc Steen of the EC, made a presentation on IPHE RCS working group: pre-competitive, pre-normative, and pre-regulation research issues. Not a funding body, but a facilitation body. Meta-gap analysis is on-going. Optimization/homogenization of the two major hydrogen incidents data bases in US and Europe. Interfacing with other organizations and groups working to facilitate the development of standards and regulations. Its Action Plan can be found at [www.iphe.net](http://www.iphe.net) and comments or questions can be sent to Mr. Steen at [Marc.Steen@ec.europa.eu](mailto:Marc.Steen@ec.europa.eu).

## 5.3 Others

### 5.3.1 CSA America

Ms. Julie Cairns made an introductory presentation on the CSA America, which is a company based in the United States that develop standards for fuel cells for stationary and mobile use. Its work is focused at the component level, but also work at system level with SAE (to insure no conflicts). Efforts include temperature compensation, dispenser system, fittings, pressure relief devices, fuel system components. CSA America will use the same process as SAE (TIR route), until the TIR is validated, and then it will go through ANSI process. Would like documents to be considered for inclusion in global regulations.

### 5.3.2 ASME

Mr. Dick Medvick gave a brief overview of progress in the development of a piping code, which may be considered in designing hydrogen filling stations.

### 5.3.3 BMW – HICE vehicle demonstration (presentation)

## 6. General Discussion on GTR

### 6.1 Structure

Draft structure developed by the co-sponsors: Presentation and handout initially developed by Mr. Albus, with modifications by other co-sponsors.

Section A: Justification and Technical Rationale (required by GTR structure)

Section B: three key areas – Storage System; Vehicle Fuel System Integrity; Electric Safety

Each of the key areas contains the following information: Scope and Purpose; Application; Definitions; General Requirements; Specific Requirements.

Question: where is the SG Environment effort incorporated? Not decided yet if there will be a GTR on environment.

Question: What does General Requirements mean? May not be needed, but is there to reflect the GTR format.

## 6.2 Scope and Application

India proposal to include 2- and 3-wheeled vehicles: At the GRPE (January) and WP-29 (March), India government representatives indicated that they did not have such an opinion on these vehicles being included. In addition, Chairman Narusawa contacted Indian motorcycle manufacturers, and they indicated that they were not aware of the proposal and did not want to have 2- and 3-wheeled vehicles included. Therefore, it is concluded that this desire was only the “personal opinion” of the India representative at the Bonn meeting.

ACTION: Mr. Albus, as the Task Manager, will formally confirm this as the official position of the Indian government in the near future.

## 6.3 Others

Discussion of order of development, schedule of development, and whether or not we should be working on all subjects at each meeting or if we should focus on a specific issue at a particular meeting.

## 7. Key Items for HFCV GTR

### 7.1 Definition

Need to identify which individual items/terms need to be defined in this section of the GTR:

- SAE and ISO agreed at the 2<sup>nd</sup> Meeting to look at a set of terms (identified also as an action item). SAE is not prepared to make any submission yet, but has sent an email with the definitions contained in J2678 and J2659. There are existing documents within the ISO family that contain definitions: i.e., ISO 15869. SAE would need permission from ISO to distribute. EIHP could be considered as another source of applicable definitions.
- Need our own set of consistent definitions, since there are some inconsistencies in the available sources.
- The list should be developed near the end of the process, when we will be able to identify terms that need to be defined.

### 7.2 Hydrogen Containers (need to define boundaries so that we know what is meant)

#### 7.2.1 Compressed Gaseous

Canada: report on the updated tables on the comparison of pressure definitions, cycling requirements, and burst strength requirements (handout). Added the JARI information on 35MPa tanks. Updated the ISO information to version 3.

Comment: The U.S. FMVSS 304 is for natural gas cylinders. ANSI HGV2 is going to be separate from NGV2.

Japanese Technical Standard for Hydrogen Container (presentation and handout): Comparison to ISO 15869.3 and SAE J2579 (see table on pages 21-22). Based on Japanese CNG regulations; only for Type 3 (metal liner) and Type 4 (plastic liner) containers; maximum pressure is 35 MPa for the hydrogen container (26 MPa for CNG)

Question: Page 11 shows outline of which technical standard? JARI S001

Standardization of material evaluation methods is needed. Evaluation tests take a long time to perform, so this is being done in two steps.

Comment: Technical Reference for Hydrogen Compatibility of Materials, developed by US Sandia National Laboratories, is available online: <http://www.ca.sandia.gov/matlsTechRef/>

Revisions: increase pressure to 70 MPa, address durability, expand allowed materials, changes to the number of cycles required for some of the tests (some tests added, some perhaps depleted). Harmonize with ISO.

Question: Is this a JARI standard or a national standard? JARI S001 is referenced in the law, so it is equal to a national standard. It is used as a national regulation. It is mandatory.

Question: Is this content included in the regulation for fuel cell vehicles? Yes.

Question: Is temperature compensation applied during the fill? No. Therefore, the tank is not really fillable to 35MPa (which requires temperature compensation to get to this final pressure – see figure on page 9).

Question: What does “to be reduced” mean in the table on page 22? The Japanese OEMs think it can be lower than S001.

Question: Is the text of this regulation to be provided? Will be provided on the website (it is a very large file)

**ACTION:** Add the English-language version of the Japanese regulation to the UNECE website for SGS (note: this is not an official translation).

ISO: Hydrogen fuel tank standards - comparison of various standards (presentation and handout)

LH2: ISO 13985 and EC regulation articles 6-9. Harmonization effort – 99% aligned. (not included in SAE or JARI)

CH2: ISO 15869, EC regulation article 10-11, SAE 2579, and JARI S001. ISO covers the requirements at various levels: about 60% JARI, about 90% SAE, and 99% EC regulation.

WP.29 recognized that the reference to ISO (international) standards in the GTR simplifies the regulatory process, and that it was acceptable to refer to the international standard, rather than to reproduce the standard in the regulation.

Question: Can ISO supply the standards to the SGS? Copies will be distributed, but cannot be put on web, as they are for sale (even at the DIS stage).

Question: Are the ISO documents approved as standards? The LH2 one is a published standard, and the CH2 is in the DIS stage (up for vote until August, should be published as a standard by end of 2008).

**ACTION:** When the ISO documents are reviewed by the participants, any questions should be emailed to Ms. Gingras (and Mr. Dey) of ISO/TC197, with email copied to the co-chairs.

## 7.2.2 Liquefied

BMW proposal (handout). This is a BMW proposal, not an OICA proposal. Basis was developed during the EIHP effort, and was used to develop the UNECE proposal for liquid containers. Permission granted to do demonstration projects in many countries based on fulfilling the requirements in this proposal. Type approval text was been removed from the original UNECE draft. Diagram shows boundaries of the storage system – 4 specific components (UNECE draft included all of the hydrogen system – 12 specific components). Highly mature draft, should be updated as new technologies come to light. Comments are invited.

Question: References in the document – mix of European and ISO documents. Is this acceptable to non-Europeans? The text cites European standard “or” equivalent ISO standard. There is an opportunity to add other standards as reference if accepted by the working group.

Comment: GTR is a self-contained document – so there should not be external references (the language should be brought into the GTR, so that there is no need to find the reference). That has always been the goal of the GTR process.

Question: What is the pressure of the LH2 tank? Normal operating range is 4-8 bar (100 psi), MAWP is 12 bar (second PRD opens at 12 bar).

Question: What are the dangers/hazards associated with failure of this tank? No explosive fragmentation as there is in a 700-bar compressed gas tank. Have experience with 100 vehicles. Tank was designed according to the rules (from the stationary storage applications, as that was the state of the knowledge/experience). Burst of the (ductile) tank will not have the same consequences of the burst of a composite tank. Material is designed to handle very cold material, so it has to be ductile. Loss of the vacuum results in a very large release of gas over a very short time. This is a typical hazard of an LH2 tank, not so with a CH2 tank.

Question: When the vehicle is parked in a garage, how is the release handled? Vacuum loss (not caused by crash, because it is in a parking garage) and boiloff loss (long time stationary). In the current generation of LH2 tank, parking in the garage is not allowed. Will be allowed in the next generation.

Question: What if the boiloff system does not work? If the valve does not open, there are 2 other safety valves (redundant system), or hydrogen is diluted to below the LFL (never accumulates). No incident of vacuum breakage has ever happened.

Discussion related to inclusion of this technology in the GTR:

The immediate reaction from co-sponsors and group was that this proposal is very design-based, typical of type approval document, containing very specific language. GTR should be performance-based. Unless the proposal can be made performance-based, it would be difficult to include it in the GTR in its current form.

Changes to address performance-orientated tests or requirements are welcome.

No regulations/requirements in Japan or in the US, but the BMW vehicle has been operated successfully in both countries (intensive discussions with authorities).

BMW performed safety assessments.

Question: Can this be made available?

It is obligatory to use this draft for LH2 tanks in Germany (it is a national regulation). It is the basis of the European regulation on transport of hazardous goods.

GTR will have container requirements for high pressure containers. LH2 container can be introduced into the GTR if it can be on the same level as the CH2 section.

There is an ISO standard on LH2 on-board storage, published in 2006.

Question: BMW asked the co-chairs and the group to identify what features of the proposals were considered design-specific.

ACTION: BMW will adapt its proposal for LH2 after the revised CH2 proposal from OICA is presented and discussed with respect to performance-based requirements and technical content.

### 7.3 Vehicle-Level Fuel System Integrity (need to define boundaries here also)

Discussion of OICA proposal (handout): Five topics with the following sections: Target, Requirement, Demonstration of Compliance, and Rationale

- Post crash
  - o Using same leak limit as for gasoline and CNG vehicles (energy-equivalence) – the per-minute average is actually the one hour total (only one measurement is taken for gaseous systems). FMVSS 301 (gasoline) is a per-minute measurement, but FMVSS 303 (natural gas) is a one-hour measurement. Japan regulation does the one-hour measurement.
  - o “Uncontrolled” gas leakage (specific language is required, since with liquid hydrogen there will be controlled gas releases)
  - o Based on Japan regulations
  - o Extended to 700 bar, and included liquid hydrogen storage
  - o Use helium leakage as a surrogate but given the difference between H and He leakage rates, is that going to pose a problem..
  - o Used established leak rates
  - o Question: Is there an impact of the cylinder size? Consider including an upper-volume limitation to the cylinder (pressure drop allowed is a function of the volume of the tank, pressure of the tank, and contents of the tank - use helium for the test) – J2578 gives the translation tables (correction factors).
  - o Question: What is the typical volume of a tank? Storing 4-5 kg total, but it could be a number of tanks, so it depends on the manufacturer’s design.
  - o Question: How to correlate helium and hydrogen leaks? not so much of an issue at large flows, but is not well-correlated at very small leaks, such as through cracks (may not matter for this test).
  - o Comment: We need to agree to use international units (Pascal versus Bar); definitions required
  - o Question: What is the difference in the required test for liquid hydrogen (section b)? If inner-volume vacuum is lost, will get large boil off of liquid, and a large release through the safety lines. Different test method is described, but the test is too dangerous to do with hydrogen (liquid nitrogen is used). Will always pass the test if the vacuum does not break.
- Pressure relief systems
  - o A safety strategy might be to have an intentional ignition, so that needs to be allowed (or not prohibited)
- Single point failure conditions (change to Single Failure Conditions)
  - o Compliance section needs to be confirmed
  - o Another document shows the sensor position is required (Japan regulation images), and also include measurement in the passenger compartment. Use those locations for this test (not in the handout – to be included)
  - o Related to a running system, not a parked vehicle (where the shutoff valve will be closed). Depends on the vehicle safety design (manufacturer’s safety strategy)
  - o Question: What is the defined leak rate? One is not defined, because the leak rate (and the leakage point) depends on the system design. Worst case situation

should be considered (have to assess the system first, since the worst case will be design-specific)

- Question: This test does not cover all safety issues (over-pressurization, over-temperature, etc) – don't we need to include specifics? It was assumed that all of these excursions will result in a hydrogen release – there might be some other targets, i.e., downstream of the shutoff valve.
  - Comment: requirement for sensors in Japan regulation. This is a design specification, so it cannot (should not) be included as a requirement in the GTR. The failure must be detected in some way (configuration is to be determined by the manufacturer)
  - Question: What about multiple-point failures? There is confusion about what is meant. In this case, a single-point failure is a single location/component failure. Determining the worst case is dependent on the design - the manufacturer will have to determine/specify. This concept requires that a single failure does not lead to a catastrophic incident, and that it be detected. EHP Annex 9 has this included. Becomes difficult to remain performance-based, rather than design-specific. Redundancies, inspections, etc. could handle this requirement. Note: Regular safety inspections are not required in the US (only in a few states).
  - Comment: Demonstration of Compliance is difficult, since there are so many different vehicle designs. The draft section provided should cover all designs. Could try it out on a specific vehicle design, but at the moment it is only on paper (hope for agreement in principle). There is not 100% agreement among OICA members but it can be a good starting point. Now (or soon) should apply to a specific vehicle and write a detailed protocol.
  - Comment: Misplaced sensors, even if working, will measure in the wrong place (as currently written, the testing sensor is placed next to the manufacturer's sensor). The last paragraph before the procedure steps needs to be changed. The test sensor needs to be placed wherever the tester (safety authority) thinks is appropriate (not sure how to write this to be general). Looking for suggestions on modifications to this paragraph. US has concerns with compliance testing (repeatability, identification of worst case scenario, etc). Specifying/identifying the worst case scenario is difficult. Need to (Could?) remove "worst case" language (since this could be an infinite number of tests). Need more explanation on the philosophy used in the development of the language.
- Fuel Cell Vehicle Exhaust System
- Centerline measurement within 100mm from exhaust outlet.
  - Comment: Related to a fully-functional system. Does not apply to ICE, as there is no free hydrogen in the exhaust when operating properly. ANL did some test (hydrogen was below the detection limit). Results will be provided (BMW).
  - Question: Even if the HICE vehicle is operating properly, couldn't there be a H<sub>2</sub>-rich exhaust? No (this is not a normal condition, so not covered here). Also, we do not test gasoline ICE vehicles for hydrogen in the exhaust.
  - Question: Would it be simpler not to have the exclusion for HICE vehicles? That would simplify the language of this GTR, but would complicate the comparison of HICE vehicles with CNG vehicles (might have to include a similar test for any ICE vehicle). This section only covers the normal purge of the fuel cell – there is no purge in an HICE vehicle.
  - Question: Is there a difference between a LH<sub>2</sub> and a CH<sub>2</sub> system? This only addresses the exhaust, not any boil-off (this is covered in the storage section of the GTR). Exhaust from the fuel cell should be independent of the storage system.



- Question: What about other emissions that can be produced in an HICE? There are other regulations that cover combustion vehicle exhausts.
- Question: Why use a moving average concentration? Japan uses instantaneous concentration: Short periods of higher concentration are possible in start-up, but are not dangerous unless the 4% concentration is exceeded for 3 sec moving average (continuously higher hydrogen concentration is the danger).
- Comment: Test result related to the above issue will be provided.
- Question: Please explain the alternative to the 4% requirement: The intention is to verify that a momentary excursion above 4% is not dangerous. Data are available to support the moving average requirement. This paragraph is not needed in the Requirements section, especially since data are available to support it (perhaps put something in the Rationale section).
- Comment: change the title to Fuel Cell Vehicle Exhaust System
- Fully functional vehicle excluding the vehicle exhaust
  - All releases are already controlled elsewhere (in the sections above), so a fully functional vehicle has no additional requirements.
  - Comment: Change “single point failure” to “single failure”
  - Comment: This only covers a fully functional vehicle, so there is no failure. If the vehicle is parked (not running) or is running, permeation from the storage system (and elsewhere, since it is nearly impossible to have a completely hydrogen-tight system) is the issue. If it is running, then the exhaust is the issue. These are covered in other sections.
  - Comment: There are no basic requirements on preventing leakage. The GTR covers what to do if there is a leak (covers safety, but not quality and reliability).
  - Question: Japan regulation concept is “fail safe.” Bubble test (fuel line) to detect leaks (in Section 3 – Single Failure Conditions – above). Do we need a fail-safe concept in GTR? This section is only for normal operation.
  - Comment: as the Subgroup begins to draft GTR, it needs to avoid writing it in design restrictive terms; rather the focus shall be on performance-based requirements, approach that is explicitly expressed in the 1998 Global Agreement and subsequent ECE documents, including TRANS/WP.29/883, September 2002.
  - Comment: GTR contains only the minimum requirements; contracting parties are free to add additional requirements.
  - Comment: There is no federal requirement in the US for vehicle inspections. States can require inspections, but these are not usually so comprehensive.
  - Question: What is really needed in the section? Is there a concern that something is missing here? No response.

**ACTION:** Accept OICA draft with modifications as noted above. Mr. Rothe (OICA) will circulate a revised version. Comments should be copied to the co-chairs.

**ACTION:** If there are any other items (beyond what has been proposed by OICA) that should be added, please contact the co-chairs.

- 7.3.1 In-use
- 7.3.2 Post-crash
- 7.3.3 Others

Comments by TUV (to be sent to co-chairs for inclusion in the Meeting Minutes) made by Ms. Judith Ortenburger of TUV SUD highlighted the single failure philosophy, which requires that the

first failure be detected. Preventative measures should be higher priority than the mitigating strategies. The concern with the entire system, not only container, should be addressed.

The group discussed several different philosophies stressing the key element which is to prevent any failures. The group suggested to study any precedents that could be used in addressing the issue. For example, the example of ABS could serve as such precedent.

8. The Electric Safety Group (ELSA) met in the afternoon from 13:30 to 17:00, on Wednesday, May 14, and in the morning from 9:00 – 12:00 on Thursday, May 15., under the leadership of OICA from Germany (Mr. Heiko Mertens and Mr. Thomas Goldbach)

This was ELSA's Second meeting. In general, participants discussed existing legislation in member states. They also discussed what should be included and it was agreed that all relevant requirements should be considered for inclusion. After a draft document, which would cover all electric vehicles is prepared and finalized, it would be proposed for inclusion in the GTR. Next meeting will be held on 22-24 July in Bonn (harmonization is the focus, but work on R.100 will continue as well). The ELSA group agreed to separate from SGS so that it can accelerate its work to meet the schedule. A first draft should be ready in May 2009, at the GRSP meeting. (More detailed report/minutes of the Second meeting will be available on ELSA's website.)

#### 9. Assigning drafting responsibilities

Discussion Topics: What schedule is required to develop the GTR by the deadline of 2010? Is it possible? See Japan's presentation for timeline.

Draft recommendations for hydrogen leakage made at this meeting. The Electrical Safety group may have recommendations for the next meeting (initial proposals may be available). In 2009, meetings could focus on hydrogen containers, using the near-final versions of various standards or regulations. Work with the revised OICA draft.

Prioritization of work: OICA proposal on leakage requirements is the most advanced – this should be finalized in 2008. OICA can then develop a proposal for 2009 on container requirements. Also need to develop electric safety, but this can be done in parallel.

The cosponsors invited subgroup members to actively participate in the effort to develop text to the outlined structure. At present, US volunteered at 2<sup>nd</sup> meeting to draft the GTR and will continue its work on the draft GTR. Information will be requested from other participants. According to the co-chairs, the OICA proposal will be considered as a good starting point. Draft will be presented at the 4<sup>th</sup> meeting. Additional assistance is welcome (contact US)

#### 10. Miscellaneous Administrative Items

##### 10.1 Approval of the Decisions of the 3<sup>rd</sup> Meeting

ACTION: Co-chairs will develop a separate list of the Key Decisions and will circulate it to the group for comment

Below is a preliminary list of tasks to be completed before or at the 4<sup>th</sup> meeting of SGS:

Action Items from SGS-3 (collected from text above):

- NHTSA to provide short description of the research plan

- Contracting parties to report on how they intend to implement GTR in their national regulatory framework (important for OEMs/vehicle developers).
- Report from Powertech to be provided as soon as possible (SAE).
- Mr. Albus will ascertain India's official position on three-wheeled vehicles
- Add the English-language version of the Japanese regulation to the UNECE website for SGS (note: this is not an official translation).
- Questions to ISO documents should be emailed to Ms. Gingras and Mr. Dey of ISO/TC197, with email copies to the co-chairs.
- BMW will adapt its proposal for LH2 after the revised CH2 proposal from OICA is discussed with respect to performance-based requirements and technical content.
- OICA/Mr. Rother of GM to revise and circulate OICA draft proposal. Additional comments should be copied to the co-chairs.
- Any other items (beyond what has been proposed by OICA) that ought to be considered should be sent to the co-chairs.
- Co-chairs will finalize the list of Action Items/Key Decisions, and will circulate it to the group for comment
- Co-chairs take the responsibility to prepare a written report of no more than 2 pages, covering all issues that the Task Manager, Christoph Albus, could use in preparing his report to the June Session of WP.29.

## 10.2 Next Meeting

4<sup>th</sup> meeting proposed to be held on 24-26 September 2008 in Tokyo, Japan

5<sup>th</sup> meeting (location and dates TBD, is convenient (to the co-chair) to have the meeting in conjunction with the GRPE in Geneva – 19-20 January 2009, or some other location in Europe) would be in winter (early 2009) – meetings will be every 4 months or so. 6<sup>th</sup> meeting in China (April or May 2009).

## 10.3 Others

Preparation of report for Mr. Albus to present to WP.29 (June 2008)

As part of the 3<sup>rd</sup> Meeting, BMW graciously organized a demo of BMW's Hydrogen 7 on Wednesday, May 14. Based upon the marque's 760Li luxury sedan, the H7 was made available to the Working Group for inspection and test rides. Both the Working Group and USDOT staff had the opportunity to examine the vehicle up close and discuss its workings with engineers intimately involved with its development. In contrast to most other hydrogen-powered vehicles, the BMW utilizes a bivalent engine that burns either gasoline or hydrogen directly in its modified 6-liter V12. Fuel feeds can be toggled back and forth on the fly from the dashboard, which caused much discussion during the test rides. The SGS expressed its appreciation to Mr. Gerhard Gissibl of OICA/BMW for making this opportunity possible.

Review of Action Item list from 2<sup>nd</sup> Meeting (Document SGS 2-7) – Most items have been completed and checked off, including the numbers from US on the docket numbers of the ongoing rulemaking:

- FMVSS 305, the docket number is NHTSA-2007-28517
- Hydrogen Research Proposal: NHTSA-2004-18039.

## APPENDIX

### List of Documents from the 3<sup>rd</sup> Meeting of the HFCV GTR

Doc. n°	Label of the document	remarks
Washington DC		
SGS 3-1	Agenda of the meeting	
SGS 3-2	List of Participants	
SGS 3-3	EC ppt (powerpoint) presentation	
SGS 3-4	EC JRC IPHE ppt presentation	
SGS 3-5	OICA proposal for Hydrogen Leak /Releases from Vehicles	
SGS 3-6	SAE J2579 ppt presentation	
SGS 3-7	CSA America ppt presentation	
SGS 3-8	BMW Regulation Liquid Hydrogen	
SGS 3-9	Japan Hydrogen Container Standard	
SGS 3-10	GTR Structure Document	
SGS 3-11	Canada Container Standards Comparison Table (Updated)	
SGS 3-12	Japan Timeline Chart	
SGS 3-13	3 <sup>rd</sup> Meeting Minutes	