

DRAFT

7th Meeting of the Informal Working Group on Hydrogen and Fuel Cell Vehicles

Global Technical Regulation No. 13 (Phase 2)

November 6-7, 2019 – Stuttgart

	Agenda Items	Presenters	Documents
1	Welcome Welcome remarks by Chair, Vice-Chair, Daimler CONTRACTING PARTIES: CANADA, CHINA (Co-VICE CHAIR), EC, GERMANY, JAPAN, KOREA (Co-VICE CHAIR), US	M. Koubek H. Ito A. Schüßling	--
2	Agenda approved	M. Koubek	GTR13-7-03
3	Approval of the meeting minutes of the 6th meeting <ul style="list-style-type: none"> • Meeting minutes approved 		GTR13-6-29
4	Country Reports	Contracting Parties	
	<ul style="list-style-type: none"> a. Canada: Same direction as stated previously - will wait for Phase 2 project to be completed before adopting into Federal requirements. Intent is still to perform crash test with Mirai in Spring 2020. b. China: Renewed focus on FCVs this year. New standards being developed for range, cold start, FC stack power density. c. EC: Formal adoption of the General Safety Regulation continues. Expected to enter into force in Dec '19, becomes mandatory in 30 months (June 2022, when EC79 will be repealed). <ul style="list-style-type: none"> o Material requirements will be added in supplement. The Implementing Act (IA) will be published in 15 months. IA has a separate timeline and will include liquid hydrogen. o Until EC79 is repealed, current regulations are still in effect. Existing approvals before June 2022 are valid and there is opportunity to extend. However, approval via UNR134 is in EU legislation now, which provides more certainty. o Legislation for HDV type approval: Max length may be exceeded if it can be proven that cab is more aerodynamic. Max weight can be exceeded if alt fuel like hydrogen is onboard, which incentivizes operators to buy alt fuel trucks without disadvantages of weight, reduced payload. This legislation will be entered into force by 2019. d. USA: NHTSA is working on introducing GTR13 with amendments under Phase 2 perhaps as early as 2021, or whenever Phase 2 is completed. e. Germany: Renewed hydrogen interest for transportation and other industries. Targeting 100 stations by spring 2020. f. Japan: No update. g. Korea: Focus on hydrogen FC bus safety through crash safety, periodic inspection, power/performance of key components. Plan to propose rollover and side impact test procedures. Will also propose improvements to fire test and test procedures in 2020-21 timeframe. Focus on buses at this time, not trucks. 	K. Hendershot Y. He P. Broetjes M. Koubek G. Mair H. Ito S. Kim	-- -- -- -- -- -- GTR13-7-12

	h. USA/DOE: Global partnerships forming, both government- and industry-led with a global action agenda. Increasing priority in enabling and harmonizing codes, standards and regulation.	L. Hill	
5	Industry and Standard Development Organizations Report	Industry	GTR13-7-09
	<ul style="list-style-type: none"> a. ISO TC197: Progress made in various hardware standards. Future work to include communications and fueling protocol. b. SAE: Focus on fire test, material compatibility, addressing HDV gaps. c. CSA Group: Recently published standards HGV4.3 (stations), CHMC2 (polymers). HGV2 (CHSS) in progress with inclusion of conformable tanks. Activity starting for HPRD1 (TPRD), HGV3.1 and HGV4.3 		
Taskforce Team Update			
6	Taskforce #1: Heavy Duty Vehicles	S. Kwon (KATRI) A.Pott (OICA)	GTR13-7-11 GTR13-7-18
	<p>TF1 leader presented a progress report:</p> <ul style="list-style-type: none"> a. Scope to include heavy duty vehicles. Consensus achieved on draft language. b. TPRD direction: Proposal made to add angles of vent direction. Request CPs to review proposal and rationale and to make decision at next IWG. c. Baseline initial pressure cycle life: TF looking for data to support number of cycles necessary for 25 years. Requesting cooperation from CPs to provide any data on vehicle age vs VMT/refueling. d. Container installation requirements: Consensus to exclude requirements on specific location points. e. Sled test: No consensus on necessity of test, although if required, recommend OICA proposal. <ul style="list-style-type: none"> a. OICA: Sled test is not necessary. However, if CP want to include in GTR requirements section, then propose method such that only 1 test is used (if necessary by CP). Proposal: (1) Using acceleration values already in UNR134, 110; (2) Allowance for calculation method; (3) Criteria is same as LDV, i.e., container remains attached to vehicle at a minimum of one attachment point. b. CAN: Not needed in GTR but wouldn't oppose adding in Part I/Rationale. c. CN: Need time to evaluate proposal. d. EC: Important for EC to include this sled test in order to create implementing act. Propose to include, but give option for CPs to leave out of FMVSS. EC asking CPs to share real-world data on tank mounting failures in buses or HDV. e. JPN: Same position as EC. f. KOR: Domestic regulations have sled test already. g. USA: NHTSA does not support in GTR. Have not seen problems with mountings in CNG trucks to require such testing. f. Permeation criteria: Rationale for permeation was updated to include HDV. Consensus on proposed language. g. Hydrogen leakage criteria: The TF proposed the criteria of hydrogen leakage during in-use are also applicable for HDV. Consensus on proposed language. 		
7	Taskforce #2: Receptacle	L. Gambone (Nikola)	GTR13-7-14 GTR13-7-21
	<ul style="list-style-type: none"> a. The TF proposal references the ISO 17268:2020 now at FDIS stage. Concern is this version won't include H70HF required for HD. Discussion on how to reference/copy into GTR. Two proposals requested from TF – one references ISO/SAE and the other does not (section 5.2.1.1.1). b. Follow-up actions: (1) IWG Chair to confirm w/WP29 whether reference to standard is possible; (2) EC to confirm whether the "reference of the newest ISO and future versions" is appropriate in EU regulations. c. IWG to review proposal (GTR13-7-21 document) 		
8	Taskforce #3: Test Procedures	L. Gambone (Nikola)	GTR13-7-20
	<ul style="list-style-type: none"> a. Presented progress of TF in working through comments, which includes harmonizing to TPRD standards (CSA TPRD1 and ISO 19982). 		

	<p>b. Continued discussion on conformable/small diameter tanks – While there is a lack of experience with these designs, should not stifle innovation. Issues to be worked through include container definition (one tank/one OTV requirement), flaw cut (1.25 mm), other failure modes (e.g., vibration) should be considered. Toyota and Linamar to present more detailed proposals considering vulnerabilities and installation requirements.</p> <p>c. HRS refueling: Follow-up recommendations to come from Air Liquide. Japanese OEMs think this issue should be investigated by the station side.</p>		
9	Taskforce #4: Fire Test	G. Scheffler (SAE)	GTR13-7-16 GTR13-7-19
	<p>a. SAE presented test results (conducted in Japan and Canada) based on JARI’s proposal, with the goal to define a burner configuration. With a reasonable agreement in results, TF4 proposes to fix burner width of 600 mm. Other issues being reviewed include an alternative to venting through TPRD.</p> <p>b. Korea announced round robin testing mid-2020. JARI agreed to support and requested they contact Y. Tamura for details of burner and test procedure.</p>		
10	Material Compatibility	SAE/C. San Marchi, A. Pott (OICA)	GTR13-7-08 GTR13-7-10
	<p>a. SAE presented test methods and rationale for metals for high pressure hydrogen usage.</p> <ul style="list-style-type: none"> • SAE and JRC agree current reference to ISO 11114-4 (in UNR134) has limited usefulness but there aren’t many other standards (with tests and performance metrics) to reference. • Some concern about the number of commercial test labs that can perform the proposed tests. • Image of process: All materials (including ones already used like SUS 316L) would be tested. Once qualified, the results would be published so the material does not have to be re-tested. <p>b. OICA proposed that GTR provide reference to standards (e.g., ISO, SAE) that manufacturers must use to justify the selection process of the material. The proposal is included in Part I.</p> <ul style="list-style-type: none"> • With ongoing work in material compatibility, standards are being updated more frequently. Any updates to GTR will take a long time. • The standards that must be used to qualify will be included in Part 1 of the GTR. <p>c. CP comments:</p> <ul style="list-style-type: none"> • USA/CAN: As self-certification countries, material compatibility requirements should be in Part I, not in requirements section. NHTSA is a safety agency and as such considers safety to be number one priority and trade considerations as secondary, and when NHTSA is engaged in harmonization, it looks to improve the level of safety. • KOR: Agree with OICA position, include proposal in Part I. • EC: Needs to be in Part II/requirements but needs more discussion to see how safety requirements can be maintained while minimizing trade barriers. • JPN: Should be in requirements section. • CN: Don’t see a need for including in requirements. 		
11	Humid Gas-Aluminum Stress Corrosion	Japan	GTR13-7-04
	<p>a. Japan presented rationale and difference between SLC and SCC.</p> <p>b. Results of additional evaluation in humid hydrogen gas environment will be shared at next IWG.</p>		
12	Initial Burst Pressure Requirement (BP0)	BAM/CP	GTR13-7-15
	<p>b. BAM/Germany presented simulation data of residual burst pressure over larger number of cylinders. Simulation shows scatter due to the variability of cylinder properties due to aging. USA mentioned that there are EOL requirements (180 NWP) which already covers in-service degradation and initial variability requirement (10% within BP0).</p> <p>c. China: Reduction to 200 NWP is agreed to for 70 MPa containers, not for 35 MPa containers.</p> <p>d. Consensus for reduction of burst pressure to 200 NWP for 70 MPa containers other than glass fiber. No change to 350 NWP for glass fiber.</p>		
13	Editorial	Secretary	GTR13-7-06
	<ul style="list-style-type: none"> • IWG agreed to members of editorial team. 		

14	Long term items	Secretary	GTR13-7-06	
	<ul style="list-style-type: none"> After Secretary provided 2 options for project schedule (keep current schedule and submit in 2020 to GRSP vs. extend deadline), the Chair decided that the group should submit the document to GRSP as scheduled. Allow GRSP to decide which items to adopt asap (e.g., HDT). A concern was raised that a few items should not extend the entire project timeline. 			
15	Next IWG		GTR13-8-02	
	<ul style="list-style-type: none"> 1st week of March in Tokyo (2-6 March) Summer mtg in Brussels – last week of May or 1st week of June Fall/Oct mtg for Wash DC or Ottawa 			
16	APPENDIX: Attendees List			
	AIST BAM Beijing Nowogen Co. Beijing Yihuatong Co. Bosch CATARC CEA CSA Group Emcara Gas Development European Commission Hexagon Composites	Government of Canada GWS Solutions of Tolland Hexagon Purus GmbH Hino Motors ILJIN Composites ISO TC197 JARI Japan JASIC KATRI KHK/Japan Linamar MAXIMATOR GmbH	Mercedes Benz Fuel Cell GmbH METI/ Japan Nikola Motors OICA/Audi OICA/BMW OICA/ Daimler AG OICA/Ford OICA/GM OICA/ Honda R&D OICA/Hyundai R&D Korea OICA/Toyota OICA/Volkswagen AG	Plastic Omnium Powertech Labs Sandia National Laboratories Tokyo University Tongji University TUV Rheinland Ulster University USA/NHTSA US Dept of Energy Westport Fuel Systems Xiangyang Daan Automobile Test Ctr Zero Carbon Energy Solutions