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Item 3 of the provisional agenda
UN Global Technical Regulation No. 13 (Hydrogen and Fuel Cell Vehicles)

Draft Final Report on the Development of Amendment 1 to UN Global Technical Regulation No. 13, Phase 2 (Hydrogen and Fuel Cell Vehicles)

Submitted by the Informal Working Group on Hydrogen and Fuel Cell Vehicles, UN Global Technical Regulation No. 13, Phase 2 (Hydrogen and fuel cell vehicles) *

The text reproduced below was prepared by the experts of the Informal Working Group (IWG) on Hydrogen and Fuel Cell Vehicles (HFCV), UN Global Technical Regulation No. 13, Phase 2 (GTR13-PH2) pursuant to article 6, paragraph 6.2.7. of the Agreement.

* In accordance with the programme of work of the Inland Transport Committee for 2022 as outlined in the proposed programme budget for 2022 (A/76/6, part V, sect. 20, para. 20.76), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

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I. Proposal

Final Report on the Development of Amendment 1 to UN Global Technical Regulation No. 13, Phase 2 (Hydrogen and Fuel Cell Vehicles)

I. Introduction

1. During the 171st session of WP.29 in March 2017, the Executive Committee of the 1998 Global Agreement (AC.3) adopted the proposal for authorizing the development of Phase 2 of United Nations Global Technical Regulation (GTR) No. 13 (ECE/TRANS/WP.29/2017/56) submitted by the representatives of Japan, the Republic of Korea and the European Union.

2. During the 175th session of WP.29 in June 2018, the terms of reference (TOR) of informal working group on the UN GTR No. 13 (Hydrogen and Fuel Cell Vehicles) - Phase 2 (ECE/TRANS/WP.29/2018/75) were endorsed by AC.3.

3. During the 182nd session of WP.29 in November 2020 and the 186th session of WP.29 in March 2022, AC.3 endorsed the extension of the mandates respectively by 18 months and six months until December 2022.

II. Objectives of the Informal Working Group

4. The main IWG objectives were: (a) to tackle the development of the remaining issues described in clause I of UN GTR No. 13, Part I, (b) to reflect the on-road experience and technical evaluations experienced after the establishment of the UN GTR No. 13, Phase 1, and (c) to adapt the requirements to new technologies.

5. Although it was expected that with additional experience or additional time for fuller technical consideration, the requirements of Liquefied Hydrogen Storage System (LHSS) presented as optional requirements in the GTR could be adopted as requirements with appropriate modifications, there was very limited information available on LHSS during the activities of IWG. Accordingly, after a brief consideration, IWG agreed to maintain LHSS provisions as they are as an option for contracting parties.

III. History of the Informal Working Group Activities

6. First meeting of IWG (17–19 October 2017; Brussels, Belgium). The organization of the IWG was confirmed:

Co-Chair: N. Nguyen (United States of America/National Highway Traffic Safety Administration (NHTSA)), M. Takahashi (Japan/Ministry of Economy, Trade and Industry (METI))

Co-Vice-Chair: Y. He (CATARC (China/China Automotive Technology and Research Center)), S. Hyeong-Woo (Republic of Korea/ Korea Testing and Research Institute (KATRI))

Secretary: Y. Fujimoto (Japan/ International Organization of Motor Vehicle Manufacturers (OICA))

The draft TOR was developed. The contracting parties and other stakeholders provided updates on the research and rulemaking activities related to this GTR. The technical issues in UN GTR No. 13, Phase 1 were identified.

7. Second meeting of IWG, 5–7 February 2018 (Torrance, United States). Related standardization organizations introduced the progress of development of the standard and research institutes presented related activities. IWG set up five task forces and appointed leaders to facilitate the in-depth technical discussions on each topic by relevant experts.

- Task Force 1 - Heavy duty vehicles and buses

- Task Force 2 - Fuelling receptacle requirements
- Task Force 3 - Recommendations for test procedures
- Task Force 4 - Fire test
- Task Force 5 - Recommendations from Hydrogen technologies - International Standard Organization/Technical Committee 197 (ISO/TC197)

8. Third meeting of IWG (26–28 June 2018; Seoul, Republic of Korea). Each task force and stakeholder updated on the progress. With reference to the test procedure for material compatibility, the outcome of the work by Standard for Fuel Systems in Fuel Cell and Other Hydrogen Vehicles of the Society of Automotive Engineers (SAE J2579) will be the basis for consideration in this GTR. The need to adapt the requirement and test procedure to accommodate new conformable containers (non-axisymmetric) was recognized.

9. Fourth meeting of IWG (16–18 October 2018; Brussels, Belgium). H. Ito (Japan/METI) succeeded in the role of co-Chair. Each task force made their progress report. IWG exchanged views on the change of the initial burst pressure requirement to 200 per cent Nominal Working Pressure.

10. Fifth meeting of IWG (5–7 March 2019; Surrey, Canada). Each task force made their progress report. Discussion advanced on how material compatibility requirements would be included into the GTR.

11. Sixth meeting of IWG (18–20 June 2019; Tianjin, China). M. Koubek (NHTSA) succeeded the role of co-Chair and S. Kim (KATRI) co-Vice-Chair. Each task force made their progress report. IWG began sharing the overview of the status of each discussion topic and the expected time schedule to reach consensus. Task Force 5 concluded its activity.

12. Seventh meeting of IWG (6 and 7 November 2019; Stuttgart, Germany). Each task force made their progress report. IWG continued discussion on the regulatory framework of material compatibility requirement. Consensus was reached on the change of initial burst pressure to 200 per cent NWP for 70 MPa containers other than glass fibre. IWG agreed to set up an editorial team as TF0.

13. Eighth meeting of IWG (23, 26 and 27 October 2020 (virtual)). Y. Sakamoto (Japan/METI) succeeded in the role of co-Chair. Due to the COVID-19 outbreak, the in-person meeting planned for March 2020 in Tokyo was cancelled, which significantly impacted the progress of related experimental works. IWG agreed to request an extension of the mandate. Nevertheless, TF0 started preparing the draft GTR and compiling the outcomes of the activities of the task forces and stakeholders.

14. Ninth meeting of IWG (23, 25 and 26 March 2021 (virtual)). The progress of each issue was reviewed and the remaining areas of work were identified. The study on the service life was introduced where 11,000 cycles as prescribed in GTR No. 13, Phase 1 for 15 years of service might be conservative enough to cover 25 years of service. For receptacles, it was agreed to reference ISO17268 so that all contracting parties will refer to this ISO even with future revisions. IWG agreed that conformable containers should be covered by GTR No. 13, Phase 2.

15. Tenth meeting of IWG (28 and 29 June 2021 (virtual)). The progress of each issue was reviewed and IWG could have consensus on several issues that are to be reflected in the draft. Information related to material compatibility would be included in Part I of GTR No. 13 so that each contracting party could use them for their national/regional requirements.

16. Eleventh meeting of IWG (12, 13 and 15 October 2021 (virtual))s. K. Sato (Japan/METI) succeeded in the role of co-Chair. Remaining issues were intensively discussed so that the draft proposal could be submitted to GRSP in December 2021. However, since there were several pending issues, it was decided to postpone the submission to the May 2022 session of GRSP.

17. Twelfth meeting of IWG (24 and 27 January 2022 (virtual)). A six-month extension of the mandate was requested. IWG was able to reach consensus on all issues to be included in the Phase 2 proposal and started brushing up the document.

18. Thirteenth meeting of IWG (15–17 March 2022 (virtual)). IWG extensively reviewed the items concluded as contracting party options, to see whether these can be reduced in order to maximize the harmonization benefits and ensure convergence of the technical requirements among contracting parties.

19. Fourteenth meeting of IWG (25–26 April 2022 (virtual)). IWG reviewed and updated the draft for submission as an informal document to GRSP in May 2022.

20. Fifteenth meeting of IWG (29 and 30 June 2022 (virtual)). IWG reviewed the feedback from GRSP experts and the matters following submission to GRSP. IWG endorsed the draft for submission to GRSP in December 2022 as an official working document.

21. Upon establishment of the task forces, each task force had numerous in-person and virtual meetings, and provided effective input to IWG based on their highly technical expertise.

22. IWG submitted the following reports or proposals to GRSP:

Reference	*Title*
GRSP-62-25-Rev.1	Terms of Reference for the informal working group of Phase 2 of GTR No.13, Hydrogen and Fuel Cell Vehicles
GRSP-62-26	1st Meeting of the Informal Working Group on Hydrogen and Fuel Cell Vehicles Global Technical Regulation No. 13 (Phase 2)
GRSP-67-38	Progress Report on the Informal Working Group (IWG) for the GTR 13 on Hydrogen and Fuel Cell Vehicles (HFCV)
GRSP-70-35	Summary Report by Chair of IWG for GTR 13 (Hydrogen-Powered Vehicles) to the seventieth meeting of GRSP
GRSP-71-09	Proposal for Amendments 1 to Global technical regulation No. 13, Phase 2 (Hydrogen and Fuel Cell Vehicles)
GRSP-71-21	Overview of Hydrogen Fuel Cell Vehicle Phase 2 Project Global Technical Regulations No.13 GRSP-71-09
ECE/TRANS/WP.29/GRSP/2022/16	Proposal for Amendments 1 to Global technical regulation No. 13, Phase 2 (Hydrogen and Fuel Cell Vehicles)
ECE/TRANS/WP.29/GRSP/2022/17	Final report on the development of Amendment 1 to UN Global Technical Regulation No. 13, Phase 2 (Hydrogen and fuel cell Vehicles)