UN-ECE / GRPE informal group

„Hydrogen / Fuel Cell – Vehicles“

DRAFT **Meeting minutes – 5th meeting**

13. / 14. February 2003 - Ruesselsheim

1.1 Welcome / Opening of the meeting

Mr Mettlach welcomes the participants to the 5th meeting of the informal working group and provides an outline of the draft agenda.
The Chairman thanks Opel and Mr Rothe and Mr Mettlach for organising the 5th meeting at Opel.
New participants:
Mr Brion (Renault)
Dr Meusinger (Opel ; head of hydrogen storage facilties department)
Dr Haberberger (Opel)
Mrs Gregoire-Padró (NREL)
Mr Koubek (NHTSA)
Mr Kesten (consultant, Dynetek)
Mr Voelkening (TUEV)
Dr Oelerich (Opel)
The Chairman informs that Mr Laguna-Gomez (EC DG ENTR) intends to participate to future meetings of the informal working group.

1.2 Agenda

Adopted without alterations.

1.3 Meeting minutes of the 4th meeting

Adopted without alterations. Mr Segers volunteers to draft the meeting minutes for the 5th meeting.

1.4 Documents

The Chairman lists the following documents, distributed since last meeting:
14 working document on CGH2 expert meeting (circulated to all members of the informal group), N34, N35, N36, N37, N38,
JASIC, 2 documents ; 1 presentation still to be circulated (JASIC presentation made at the CGH2 expert meeting in Munich),
NL (2 documents)
2 informal documents presented at 45/GRPE (i.d. no.3 : draft LH2 regulation ; i.d. no.4 : status summary; available at www.unece.org)

1.5 Report last GRPE meeting (45th)

The Chairman refers to the 2 IDs that have been presented at 45/GRPE with, apart from the issue of type of containers, no discussion. 46/GRPE scheduled from 19-23 May. The LH2 draft regulation (ECE-R under the 1958 agreement) will be presented as an official document to GRPE (see item 4.).

2. Presentation Opel “Hydrogen & Fuel Cell activities at Opel/GM”

Presentation by Dr Meusinger and subsequent discussion. The Chairman thanks Mrs Meusinger for the excellent presentation. Opel will make the presentation available to the group through the EIHP website.

3. Draft regulation CGH2

3.1 Meetings of the CGH2 expert group

Presentation by Mr Adams:

- EIHP meeting Goteborg Jan 2003

- 3rd meeting GRPE/ISO, Munich Jan 2003
  - o Type 1 discussion (final conclusion to retain current rev 10 performance requirements with ISO considering similar approach for future revision)
    - Mr Dey suggests to extract elements from ECE as basis for performance-based DIS
  - o ISO 15869 vs annex 7
  - o Results see N038

- 1st meeting CGH2, Munich Jan 2003
  - o Results see N006, 007 and 008
  - o Main discussion on components to be type-approved
    - JASIC (pressure) vs TUEV (pressure and leak)
    - JASIC safety study as basis for GTR development
  - o Terminology
    - nominal working pressure
    - MAWP
  - o TUV proposal to include burst test for components (still outstanding)
  - o RDW concerns regarding container assemblies and removable storage systems (still outstanding)

- 2nd meeting CGH2, Ruesselsheim Feb 2003
  - o Results see N015
  - o Outstanding issues
    - GRPE-related
      - Type 5
      - Scope: extent of hydrogen system to be covered
      - Container assembly
      - PSA proposal
      - Component burst test
      - Modification of §14.1.17 (MAWP)
      - Ageing test
    - GRPE-ISO related
      - Batch test burst pressure tolerance (ISO survey)
      - Extend scope to include stainless and welded steel as a material

3.2 Confirmation of solved issues

3.2.1 Type 1

- o Mr Dey states ISO's resolve to draft a performance-based ISO standard for inclusion into GTR (or into ECE if ready in time to ensure full harmonization).
  The Chairman confirms that any future ISO standard can be considered at every stage of the process.
- o OICA survey result: balanced so action is necessary.

3.2.2 NWP/MAWP

To be reflected in rev 11.

3.3 Discussion of unresolved issues

3.3.1 GRPE-related

3.3.1.1 Type 5
Postponed to LH2 discussion.

3.3.1.2 Components to be type-approved
Doc N006: -- JASIC vs TUV philosophy
-- Compromise : class O components + other safety components (opposed by JASIC).
Mr Koubek asks a clarification of the JASIC philosophy.
Mr Fujimoto explains JASIC's support for system approval (rather than component approval) on the basis of the presentation material used in Munich (to be circulated by Mr Adams); clear need for scientific data to evaluate burst risk (energy = pressure x volume).
The Chairman concludes that the proposed ECE regulation should be based on the TUV compromise, acknowledging JASIC's opposition and reconsidering JASIC's proposal for GTR development.
Mr Koubek states that the US is unable to support any of the 2 philosophies at this moment (due to US NHTSA's prioritization of analysis of main risks).
Mr Bassi reminds the group that comparison to R110 could become a liability during future discussions in GRPE.

3.3.1.3 Scope: extent of hydrogen system to be covered
Mr Bauer explains EIHP's rationale behind extending the scope to include all components prior to entering the fuel cell.
Mr Rothe asks what the reason for such extension is and what the boundary pressure for such an extension should be.
Mr Dey supports Mr Bauer's suggestion to reword 2.1.26 but proposes to amend 2.1.23 to read "… fuel cell system" with additional definition of fuel cell system.
The group sees the need for multi-lateral discussion to evaluate EIHP's suggestion to extend the scope. The outcome of the discussion will determine the possibility to provide an ID for CGH2 proposal by 46/GRPE.

3.3.1.4 Container assembly
Mr Adams reports on the inability to arrive at a compromise; need for continued discussion at expert level to find acceptable wording.
Mr Rijnders and Mr Adams suggest having a combined discussion linked to the PSA proposal during a dedicated future meeting. This approach is supported by Mr Dey.

3.3.1.5 PSA proposal
Mr Adams reports on the discussion that took place in Munich. Currently some editorial issues have to be resolved.
Mr Van Eegher suggests circulating a revised document for joint discussion with the issue of container assembly. Mr Van Eegher presents a proposal for compromise based on GRPE 008, arrived at after a discussion with Mr Rijnders:

-- New definitions for "removable storage system" and "removable storage system connector"; agreement to change "… shall consist …" to " .. consists …".
-- Need for manufacturer to demonstrate to the satisfaction of the approval authority the necessary safety measures during handling.
--§14.3.6: suggestion to increase allowable leakage up to 100 Ncm^3 (instead of 20).

3.3.1.6 Component burst test

Mr Adams informs the group of TUEV's proposal in Munich to include an additional hydrostatic burst test at 3 times MAWP/NWP; current TUV request is factor of 4.
Mr Rothe reminds the group of Opel's opposition and of the fact that R.110 does not have such test requirement.
Mrs Ortenburger suggests discussing this fundamental issue (which was already tabled in September 2002) at a meeting hosted by TUEV in Munich.
Mr Bauer states his opposition to any detailed materials discussion for type-approval purposes.
Mr Voelkening states that it should be recognized that R110 is imperfect and that the regulation for H2 should be considered in more detail.
Mrs Ortenburger reminds the group of the 2 questions that have to be resolved: burst test or not and if yes at which pressure? In case a burst test is not accepted, TUEV will request a cycling test.
The Chairman suggests having an expert meeting in March with a planned meeting of the informal group in April (to allow the presentation of an informal document for 46/GRPE).

3.3.1.7 Modification of §14.1.17 (MAWP)
Mr Adams refers to the minor modification by UTC contained in doc GRPE 012 (page 2) which could be added to the agenda of the expert meeting in Munich in March. The Chairman agreed.

3.3.1.8 Component marking
The Chairman reminds the group of the request for position papers on this subject. No comments were received and the question was not addressed in any detail. There is a general consensus that parts numbers could serve for marking purposes.
Mr Rothe volunteers to draft a text on the subject of marking to be included in rev 11.
Mr Rijnders suggests to check compatibility with UN/ECE approval practices.

3.3.1.9 Ageing test
Mr Adams reports on TUEV's proposal to re-discuss the ageing parameters (see doc GRPE 012). TUEV suggests aligning with R110 or to look for an appropriate compromise (TUEV proposal: 1 week instead of 24 h in view of the less aggressive agent and shorter test period; especially for plastics and O-rings).
Mr Oelerich points out that the ozone test is considered too aggressive and does not see any need to change the EIHP requirement (i.e. oxygen ageing test).
Mr Voelkening informs the group that Powertech has made it clear that there is no confidence in how the ageing tests relate to real life operation.
Mrs Ortenburger suggests adding this subject to the agenda of the meeting scheduled for March in Munich.

3.3.2 GRPE-ISO related

3.3.2.1 Batch test burst pressure tolerance (ISO survey)
Mr Adams refers to Air Liquide's proposal to include a tolerance for batch test results in relation to the type-approval results.
Mr Dey informs the group of the response from currently 6 manufacturers rejecting the extra requirement. There is a suggestion to involve the European Cylinder Manufacturers Association (ECMA, covering any type of pressure vessel for any type of application). Mr Dey suggests that the survey be circulated together with the meeting minutes.
Mr Voelkening states that such an extra tolerance is required to ensure conformity of production thereby guaranteeing safety (to distinguish between good and bad cylinder manufacturers).
Mr Bauer and Mr Stoll point out that type-approval and quality assurance are separate issues and state that the current COP philosophy should be retained (i.e. comparison of production to prescribed TA limits rather than to actual TA results).
Mr Dey suggests taking up the suggestion to involve ECMA with GRPE/EIHP members attending the meeting on 13 March in Brussels.
The Chairman reminds members that the informal working group has to refrain from fundamentally changing TA practices.
Mr Rothe suggests to ask GRPE (or any other responsible body) if/how to address any perceived safety risks because of possible discrepancies between performance during TA and production performance.

The Chairman concludes that this subject should not hinder the adoption of the ECE regulation in phase 1 but should be considered for phase 2. The group agrees to Mr Dey's suggestion to ask ECMA to look into this.

3.3.2.2 Extend scope to include stainless and welded steel as a material

Mr Kesten points out that appropriate references to types of stainless steel have to be found and informs that Dynetek is one of the few companies producing H2 storage devices. Dynetek is in the process of developing 700 bar system together with DC and Ford (based on type 3 container). Mr Kesten therefore suggest adding references to (EN) standards for stainless steels (and other steels) in Annex 7 to allow the use of such liners for higher-pressure storage systems.
Mr Adams expresses his disappointment at the late submission of the comment and reminds the group that this will lead to another discussion on design-restrictive standards. Mr Adams, although supportive of including all possible solutions, fears that there will be no time until May to get agreement.
Mr Dey concludes that this in any case means rediscussing also the solution for type 1 containers and to try to achieve a global solution.
The Chairman suggests trying to finalise the issues of container assemblies and removable containers to enable the tabling of an informal document at 46/GRPE. The Chairman expresses the hope that also ISO-related issues can be taken on-board by that time.
Mr Rijnders outlines a possible solution for stainless steel and welded steel containers by continuing with the drafting of the ECE regulation and in the meantime looking for most appropriate solutions.
Mr Rijnders points out that there are no opposing views on the need to incorporate container concepts that are expected to come to the market in the not too distant future.
Mr Stoll suggests that a solution at GRPE on the subject of advanced technology (not yet covered by the scope of the regulation) could also provide ways to address stainless steel and welded steel containers.

The expert meeting in Munich is scheduled on 5 March, chaired by Mrs Ortenburger. On the basis of the above, the Chairman regards the submission of rev11/12 as possible. This will require a meeting of the informal group either end of April or beginning of May.

4. Draft regulation LH2

The Chairman reminds members of the submission of rev 13 of LH2 as informal document. A formal document (draft LH2 ECE-R under the 1958 agreement) will be available at 46/GRPE with 2 issues still to be resolved (the fundamental aspect related to § 6.2 will be tabled by Mr Gauvin at WP29 in March).
Mr Stoll presents the mistake found in § 6.3.1. related to the use of the set pressure of the primary relief device instead of the MAWP of the container in defining

Mr Stoll asks if the system approval mark can be deleted for both LH2 and CGH2 (referring to the OICA proposal to delete the system approval mark). Mr Laurent informs that OICA is in the process of expanding the principle to all regulations affecting GRPE. In view of the fact that there is still no final decision by WP29, the group agrees to put the requirements for system approval mark in square brackets.
The Chairman states that the group will have to await the outcome at WP29 on the fundamental question and asks Mr Stoll to provide him with a revised document which can be submitted to the ECE Secretariat to become a formal document.

5. Combined regulation LH2 and CGH2

The Chairman informs the group of the informal request from Mr Gauvin and Mr Souchet to have 1 consolidated document for both LH2 and CGH2. The Chairman's initial reply was negative in view of the regulations having been developed as stand-alone documents. Due to organizational and financial implications for the UN-ECE and EU in handling multiple documents, the Chairman requests members' comments.
Mr Stoll states not to be favorable to having a combined document for practical/timing reasons.

Mr Adams states that there are a number of common elements for which it would make sense to draft a consolidated document but points out that there would be a time delay for LH2.
Mr Dey responds by looking at the benefits of having a common approach.
Mr Rijnders states that he understands the reasons for having a combined document but has no real preference.
Mr Rothe suggests that it would make more sense to combine CGH2 and CNG than to combine CGH2 and LH2.
Mr Pichon states that, for reasons of time pressure, a combination of documents is not preferable.
The Chairman will report to Mr Gauvin that the group recognizes the perceived benefits of having a single document but that, because of a multitude of drawbacks, it is considered best to keep the 2 subjects separate.

6. GRPE informal group Hybrid electric

The Chairman reports on the activities of the informal working group on hybrid vehicles. On the basis of current definitions, it is the Chairman's understanding that it will be possible in future for fuel cell vehicles to be also considered to be inside the scope.
Mr Mettlach point out that only hybrid fuel cell vehicles would be covered.

7. EIHP report

The Chairman asks Mr Stoll to present an outline of the regulations that need to be looked at in view of H2 and Fuel Cell Vehicles.
Mr Stoll provides a status report on EIHP's activities to update other ECE regulations.
The Chairman does not see the need to initiate any working group action (today). Mr Stoll asks what the practical work sequence should be. The Chairman proposed that EIHP proposals to amend ECE regulations should be submitted to the respective GR. This will require new mandates to be provided to start up the work.
Mr Stoll replies by reminding the group of the expertise on all aspects of H2-fuelled vehicles already available in this informal group. In response to a question from Mr Koubek, Mr Stoll suggests using the informal GRPE working group as channel for circulating (in some cases already existing) proposals to the responsible GR. To assist interested parties in reviewing the existing proposals, Mr Stoll will ensure that they will be made available through the EIHP website.
In view of this competency available within the group, the Chairman, supported by Mr Rijnders, agrees to have preliminary discussion/evaluation by the informal working group of any EIHP amendment on all different aspects.

8. AOB

Mr Dey reminds members that ISO10286 was attached to the meeting minutes of the meeting in Cologne. The group agrees that the issue is now resolved.

9. Further action and time schedule

The special CGH2 expert meeting is scheduled on 5 March in Munich (TUEV). Depending on the outcome of that meeting the next meeting of the informal group is scheduled on 10 and 11 April in Gothenburg. It#s planned to present a draft CGH2 regulation (ECE-R under 1958 agreement).