

Minutes of the 3rd meeting of the Informal Group on Global Technical Regulation No. 9 – Phase 2 (IG GTR9-PH2)	
Venue	Offices of the “Organisation Internationale des Constructeurs d’Automobiles” (OICA - International Organization of Motor Vehicle Manufacturers), 4 rue de Berri, 75008 Paris
Date	29 – 30 May 2012
Status: Final	

A) List of Attendees

Abraham	James	Mr.	Ford of Europe (United Kingdom)	jabrah11@ford.com
Beebe	Mike	Mr.	Humanetics (U.S.A.)	mbeebe@humaneticsatd.com
Bilkhu	Sukhbir	Mr.	Chrysler (U.S.A.)	ssb@chrysler.com
Borde	Patrick	Mr.	Faurecia (France)	Patrick.Borde@faurecia.com
Broertjes	Peter	Mr.	European Commission (European Union/Belgium)	Peter.BROERTJES@ec.europa.eu
Burleigh	Mark	Mr.	Humanetics (United Kingdom)	mburleigh@humaneticsatd.com
Chaka	Michelle	Ms.	Ford (U.S.A.)	mchaka@ford.com
Corwin	Cort	Mr.	Shape Corporation (U.S.A.)	corwinc@shape-corp.com
Damm	Richard	Mr.	Federal Ministry of Transport, Building and Urban Development (BMVBS) (Germany)	Richard.Damm@bmvbs.bund.de
Dausse	Irina	Ms.	Renault (France)	Irina.Dausse@renault.com
Davis	Peter	Mr.	Society of Motor Manufacturers and Traders (SMMT) (United Kingdom)	pdavis@smtt.co.uk
Edwards	Randy	Mr.	Auto Alliance (U.S.A.)	wreandtct@aol.com
Hand	Jim	Mr.	Department for Transport (U.K.)	Jim.Hand@dft.gsi.gov.uk
Hardy	Brian	Mr.	Transport Research Laboratory (TRL) (U.K.)	bhardy@trl.co.uk
Heß	Christian	Mr.	Audi (Germany)	christian.hess@audi.de
Kinsky	Thomas	Mr.	General Motors Europe/Opel (Germany)	Thomas.Kinsky@de.opel.com
Knotz	Christoph	Mr.	Concept Tech GmbH (Austria)	christoph.knotz@concept-tech.com
Kolb	Jan-Christopher	Mr.	Bertrandt (Germany)	jan-christopher.kolb@de.bertrandt.com
Konosu	Atsuhiko	Dr.	Japan Automobile Research Institute (JARI) (Japan)	akonosu@jari.or.jp
Lenzy	Petty	Mr.	Shape Corporation (U.S.A.)	pettyl@shape-corp.com
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Ries	Oskar	Dr.	Volkswagen (Germany)	Oskar.Ries@volkswagen.de
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Yoon	Yong-Won	Mr.	Korea Automobile Testing & Research Institute (KATRI) (Korea)	yyoon@ts2020.kr
Zander	Oliver	Mr.	Federal Highway Research Institute (BASt) (Germany)	zandero@bast.de

Ms. Chaka and Ms. Versailles as well as Messrs. Beebe, Bilkhu, Edwards, Hardy, Petty, Nguyen, Tedesco and Thedinga attended the meeting via telephone/WebEx.

B) List of Actions

ID	Open action Item	Responsibility	Due
A-2-01	Check EEVC information on statistics regarding knee injuries that were provided during development of EEVC legform impactor	U.K. DfT	4 th meeting
A-2-03	Provide more details / the final document from the research project with Autoliv on pedestrian injuries	NHTSA	4 th meeting
A-2-04	Provide more detailed information regarding the concerns mentioned during the discussion on the cost/benefit assessment of the FlexPLI	OICA	4 th meeting
A-2-12	Update manual with visual inspection parameters	Humanetics	4 th meeting
A-2-13	Establish a Task Force “Bumper Test Area” (TF-BTA) discussing the possible changes to the bumper test area	European Commission	Before the 4 th meeting
A-2-14	Provide information on the rational why Euro NCAP changed the bumper test area	European Commission	Before the 1 st TF-BTA meeting
A-3-01	Present detailed data from GIDAS dataset on risk of pedestrians being injured by the bumper area	OICA, BAST	4 th meeting
A-3-02	Organize that TF-RUCC information is stored at the IG GTR9-PH2 website (instead of TEG website)	TF-RUCC chair	Before the 4 th meeting
A-3-03	Compare test results presented in document TF-RUCC-3-05 with new proposed corridors (to be presented to TF-RUCC)	Bertrandt, OICA	(next TF-RUCC meeting)
A-3-04	Finalize TF-RUCC discussion preferably before the summer break, present results to the next meeting	TF-RUCC chair	4 th meeting
A-3-05	Update document GTR9-2-10r1 to reflect findings of the 3 rd meeting (certification tests were conducted with long rubber sheets at the FlexPLI tibia, vehicle tests with short rubber sheets) and provide revision 2 of this document	OICA	4 th meeting (document GTR9-2-10r2 already provided during the 3 rd meeting)

A-3-06	Provide a form that allows IG GTR9-PH2 members to indicate their interest in vehicle testing	Chair, Vice-chair, Secretary	ASAP
A-3-07	Indicate interest in vehicle tests as proposed in document GTR9-3-06 or how tests can be supported	All	4 th meeting
A-3-08	Provide details on updating existing FlexPLI's to the latest build level (time, costs, check list etc.)	Humanetics	4 th meeting
A-3-09	Provide information on how friction influence the impact speed of the ram	Concept	4 th meeting
A-3-10	Explanation on the detail of information that will be needed for PADI/drawings according to the future "Special Resolution No. 2"	Chair/U.K. DfT	4 th meeting
A-3-11	Provide drawing (with disclaimer for the time being)	Humanetics	After 4 th meeting
A-3-12	Provide information on technical feasibility of vehicle countermeasures to meet FlexPLI requirements	OICA	4 th meeting

C) List of Meeting Documents

- GTR9-2-02 (Chair/Secretary) Minutes of the 2nd meeting of the Informal Group on Global Technical Regulation No. 9 – Phase 2 (IG GTR9-PH2) – Draft
- GTR9-2-02r1 (Chair/Secretary) Minutes of the 2nd meeting of the Informal Group on Global Technical Regulation No. 9 – Phase 2 (IG GTR9-PH2) – Final
- GTR9-2-04r1 (BAST) Robustness of SN02 prototype test results – Revision 1
- GTR9-2-10r1 (OICA) FlexPLI Comparison (Impactors: SN02, SN04, IND-Impactor - Test experiences) – Revision
- GTR9-2-10r2 (OICA) FlexPLI Comparison (Impactors: SN02, SN04, IND-Impactor - Test experiences) – Revision 2 completed during the 3rd meeting on 30.05.2012
- GTR9-3-01 (Chair/Secretary) Agenda for the 3rd meeting of the Informal Group on Global Technical Regulation No. 9 - Phase 2 (IG GTR9-PH2) – Draft
- GTR9-3-01r1 (Chair/Secretary) Agenda for the 3rd meeting of the Informal Group on Global Technical Regulation No. 9 - Phase 2 (IG GTR9-PH2) – Final
- GTR9-3-02 (Reserved for the minutes/this document)

GTR9-3-03	(Chair) Informal document GRSP-51-25 : (Draft) Second progress report of the informal group on Phase 2 of gtr No. 9 (IG GTR9-PH2)
GTR9-3-04	(Humanetics) FlexPLI GTR User Manual, Revision C, 2011
GTR9-3-05	(BAST) Robustness of SN04 prototype test results
GTR9-3-06	(BAST) Proposal for a future vehicle test matrix
TF-RUCC-2-03	(BAST) FlexPLI Inverse Certification Corridors-Further Test Results
TF-RUCC-2-05	(Humanetics) Humanetics Inverse and Round Robin Leg Preparation
TF-RUCC-3-03	(Chair of TF-RUCC) Japan Progress - Report Review and Update Certification Test Corridors and Test Methods, 8 May 2012
TF-RUCC-3-04	(BAST) Review of Dynamic Assembly Certification Corridors
TF-RUCC-3-05	(Bertrandt/ACEA) FlexPLI Certification Testing, 24 May 2012

D) Summary of Meeting

1. Welcome

The chair welcomed the group at the OICA offices in Paris.

2. Roll call of participants

The attendees (see above) introduced themselves.

3. Adoption of the agenda

The draft agenda was modified adding the different documents to the respective agenda items. This modified version of the agenda (see document GTR9-3-01r1) was finally adopted.

4. Review of the Minutes of the 2nd Meeting (document GTR9-2-02)

The secretary had received comments of Mr. Burleigh (Humanetics) and Mr. Zander (BAST) in advance to the meeting. The comments were reviewed in detail and after further slight modifications the minutes of the 2nd meeting were finally adopted as document GTR9-2-02r1.

5. Review of information provided to and discussion at GRSP during their 51st session in

May 2012 (document GTR9-3-03)

The chair presented the 2nd progress report (see document GTR9-3-03) that originally was presented to GRSP during their 51st session from 21 - 25 May 2012 in Geneva. Only some questions were raised to clarify details. The document is planned to be submitted to the June 2012 session of WP.29 as an informal document and to the November 2012 session of WP.29 as an official document for their review and adoption.

6. Review of accident data, especially related to tibia and knee injuries (action items A-2-01, A-2-02 and A-2-03 of the 2nd meeting's "List of Actions") (U.K. DfT, JASIC, NHTSA, OICA, all)

A-2-03: The respective action items were reviewed. It was mentioned that NHTSA had sent their apologies in advance since their study has not yet been finalized. However, the information was announced to be available for the 4th meeting.

A-2-01: Mr. Hand (U.K. DfT) asked to apologize the delay on their activity and promised to deliver as soon as possible the information on statistics regarding knee injuries that were provided during the EEVC activities.

A-2-02: Mr. Takahashi (JASIC) explained that during the 2nd IG GTR9-PH2 meeting Mr. Hardy (TRL) had asked for clarification why the bending moment at the knee joint was zero despite the knee joint itself can withstand certain loads. Mr. Takahashi explained that the assumption is based on the research results of Nagoya University presented at Japan SAE in 2011 but also at the 2012 SAE World Congress. The detailed reference is: Mizuno, K.; Ueyama, T.; Nakane, D. and Wanami, S.: Comparison of Responses of the Flex-PLI and TRL Legform Impactors in Pedestrian Tests; SAE Int. J. Passeng. Cars - Mech. Syst. 5(1):2012, doi:10.4271/2012-01-0270. The document can be purchased from SAE store (<http://store.sae.org/>). Mizuno et al. explain there in detail that the maximum tibia bending moments occurs when the reaction forces are at their maximum but that the knee bending moment is very low at the same time, i.e. knee bending moment at that timing are negligible.

Also, it was mentioned that Mr. Thedinga (TUV Rheinland Japan) had handed in a document that shows a picture from the 8th edition of the Bosch Automotive Handbook. However, it is unclear whether the publication could offend any copy rights and it was therefore agreed to just mention the important details: The handbook refers to data of the German In-Depth Accident Study (GIDAS) of 2006 and for a pedestrian the bumper area caused around 15 % of the risk of being injured. The number of injuries considered in the referenced dataset was 2,338 in total.

Mr. Zander remembered that detailed GIDAS data are available from several studies and that OICA had already presented information on this at several occasions. Together with

OICA members, Mr. Zander will try to find out appropriate details.

7. Discussion (ongoing) on cost/benefit assessment (action item A-2-04) (OICA, all)

The chair asked whether new information on this is available from OICA, specifically from US industry. Mr. Edwards (OICA) explained that a new study on the details was assigned to a contractor and that results should be available in due time for the 4th meeting. However, the injury assessment abilities are clearly seen to improve for the FlexPLI compared to the EEVC LFI but cost-benefit analyses are not yet fully clear. Actually, this is not the business of industry but NHTSA is expected to do such analyses for their future NPRM (Notice of Proposed Rule Making) process. Mr. Nguyen (NHTSA) confirmed that respective activities in the US are going on and also promised to present this at the next meeting the latest (see also action item A-2-03).

8. Status of ongoing discussion on the certification corridors: activities of the “Task Force Review and Update of Certification Corridors” (action items A-2-05 and A-2-06) (TF-RUCC chair, Humanetics, all) (documents TF-RUCC-3-03, TF-RUCC-3-04, TF-RUCC-3-05)

Dr. Konosu (JARI) in his responsibility as chair of the Task Force informed the attendees that the activities are still going on. The last WebEx meeting was held just the working day before this Informal Group meeting. There, presentations had been held by Japan, BAST and Bertrandt summarizing their activities. JARI and BAST had presented the results from the tests with the three impactors that were specifically prepared for the TF-RUCC activities. The results of tests with these “master impactors” will be used as the main source to define new corridors if needed. In addition, Bertrandt had conducted tests with a number of series production legforms on behalf of European OEM’s. However, not all tests were finalized before the TF-RUCC meeting. Therefore no final conclusion could be presented to this meeting.

On request of the chair of the IG GTR9-PH2, Dr. Konosu presented some more details: Document TF-RUCC-3-03 explained the activities in Japan. The three impactors for the corridors’ review were carefully prepared and certified on component level as well as on assembly level. Test results achieved with the impactors are repeatable and well fit if a slight shift is applied to the current corridors for both, the pendulum as well as the inverse certification test. Therefore finally JARI proposed a slight shift of the certification corridors to assure that test results can fit the corridors under all conditions.

Mr. Zander presented the test results of BAST (see document TF-RUCC-3-04). He explained the proposal on recalculating the certification corridors based on the test results achieved at JARI and BAST. At BAST, inverse certification test results also fit the corridors but are border-line for some of the measurements. However, out of > 100 test results for the particular FlexPLI segments just 6 missed the inverse tests’ corridors. BAST proposed updated corridors

so that all results of the specifically prepared legforms met the revised corridors. For the pendulum test results, the situation was more severe since all MCL and several ACL/PCL segments did not meet the current pendulum corridors. In the end, similar conclusions could be drawn and also modifications to the corridors were proposed.

Mr. Burleigh (Humanetics) wondered whether other labs can also contribute to the activities and Mr. Zander replied that Humanetics and other labs are expected to test legforms and preferably confirm the data. Also, Mr. Burleigh was concerned with the narrower width of some of the inverse corridors as they were already narrow. Mr. Zander responded that the basis for the definition of the corridors should be real test data. Finally, Mr. Burleigh wondered whether vehicle tests should be conducted and the impactors then should be retested to confirm the results afterwards. Mr. Kolb (Bertrandt) mentioned that in his company tests were run with series production legs of different build levels that already were used frequently for vehicle testing. The test results achieved with those legforms in principle confirm the test results presented by Mr. Zander.

Mr. Kolb presented document TF-RUCC-3-05 on results of tests conducted for the European Automobile Manufacturers' Association (ACEA). In the project, three series production FlexPLI's of different build levels were tested. The tests were conducted by Bertrandt and also by BGS Boehme and Gehring. Additional test with further legforms have already been planned. Mr. Kolb pointed out that in their tests test results could be achieved with the series production impactors that are similar to those results achieved by JARI and BAST with the master legforms. Therefore, similar conclusions can be drawn for the redefinition of certification corridors. However, Mr. Kolb also noted that it remains unclear what needs to be done when an impactor frequently fails the certification tests and that a possibility to adjust the performance of an impactor is missing. Dr. Konosu recommended to Mr. Kolb that it is better to repair the impactor with new parts in such situations.

Dr. Konosu concluded the TF-RUCC presentations with a statement that he is optimistic that activities can be finalized before the next meeting.

On request it was explained that the TF-RUCC documents were shared via e-mail and also should be available at the IG GTR9-PH2 website. However, unfortunately the documents have mistakenly been uploaded to the website of the former Technical Evaluation Group (see subsection "FlexPLI subgroup" under section "Informal Group on Pedestrian Safety" on the UNECE GRSP website:

http://www.unece.org/trans/main/wp29/wp29wgs/wp29grsp/pedestrian_flexpli.html). The chair of the Task Force was requested to take this up again with the Geneva secretariat and to organize that the information is changed to a subsection under section "Informal Group on GTR No. 9 – Phase 2".

Mr. Knotz (Concept Tech) wondered whether Bertrandt had already double-checked their test results against the new corridors proposed by BAST. Mr. Kolb replied that this had not yet been done but could be done if wished for. It was agreed that this should be presented

in the next meeting.

The chair of the Informal Group summarized that the activities are intended to assure that certification tests can be met by the majority of the impactors. However, it does not necessarily need to include all impactors. Mr. Zander added that the number of test results is still limited and further tests will be conducted whose the results should preferably confirm the existing data. However, currently an agreement on the procedure to define the new corridors should be achieved and based on this all new test results can be assessed.

Dr. Ries (OICA) wondered whether further master impactors (the specifically prepared impactors) are available for testing and whether the impactors in the market can be updated accordingly. Mr. Burleigh replied that no further master legs are available to test but it is intended to build new production legs in the same way as the master legforms. In addition, all impactors can be modified to meet the latest build level. However, by now impactors' bone cores were fine-tuned towards the stiffer sides of the bone core production corridors (which had been developed at JARI) since Humanetics test results had shown higher stiffness's than JARI ones and since assembly test results were better with this. Dr. Konosu insisted that it is essential to finalize the corridor update activities with the master legs before discussion starts on update activities for other impactors.

Coming back to Mr. Burleigh's earlier questions the chair asked whether the data of certification test after vehicle tests should be involved into the development of update corridors. Mr. Zander replied that data from the prototype legform SN-02 had been presented that show no significant influence of vehicle tests. Dr. Konosu felt that such tests are not needed: Tight corridors are wished for to assure that the legforms guarantee a reliable performance. Mr. Kinsky added that the corridors may also serve as indicator whether impactors are outworn and need maintenance or updates. So, defining the corridors using new or overhauled impactors also makes sense under this aspect.

Mr. Bilkhu (OICA) asked for confirmation that the corridor discussion only refers to the speeds of the certification tests. This was confirmed.

The discussion was concluded with the request of the IG GTR9-PH2 chair to preferably finalize the discussion on the corridors before the summer break.

9. Further experiences from testing with the FlexPLI

9.1. Update on the test data provided during the 2nd meeting (action items A-2-07, A-2-09 and A-2-10) (OICA, all) (document GTR9-2-10r1)

The action items mentioned above were reviewed. Regarding action item A-2-07, the chair explained that NHTSA had already mentioned that the raw data of their certification tests

will be publically available. OICA added that they do not see an issue with providing such information for the certification tests. However, manufacturers cannot agree to provide raw data of vehicle tests.

Mr. Hess (OICA) shortly presented the amendments in the OICA presentation reporting on test experiences with different FlexPLI's (see document GTR9-2-10r1). He highlighted that some of the test results seem to contain discrepancies. Mr. Burleigh mentioned that SN-04 where the discrepancies occurred was still equipped with short rubber layers in front of the tibia. Mr. Zander replied that the inverse certification of the impactor was performed at BAST and that BAST had replaced the short rubber sheets with long ones for the certification testing at that time since the respective design change had already been clear. For this purpose, BAST had got a set of long spare rubber sheets. However, after certification tests impactors were forwarded to users in their original status, i.e. with short rubber sheets. Mr. Hess explained that in his company the tests were performed with the impactor as delivered. Unfortunately, he cannot say even from test video reviews etc. what the actual status was. Some discussion on this came up and the chair concluded that this clearly proves that tests need to be conducted under specified conditions. However, Mr. Hess will update the presentation with the information that certification tests were conducted with long rubbers but vehicle tests with short rubbers. The respective updated presentation will be added as document GTR9-2-10r2.

Mr. Edwards wondered whether a modification to the certification tests would be possible to finally just have one certification test. The pendulum test seems to deliver more reliable results and if an adaption of the speed were possible this might solve open issues. Dr. Konosu explained that the pendulum certification test just uses the gravitation as acceleration and that it may be difficult to accelerate the impactor in the pendulum test rig.

9.2. Further experiences from testing with prototype and/or series production legforms (action item A-2-11) (BAST, all) (documents GTR9-2-04r1, GTR9-3-05)

Mr. Zander presented the update of the presentation on the robustness of impactor SN-02 (see document GTR9-2-04r1). He pointed out that the rubber material was changed during the time the legform was used and that therefore 12 tests were conducted with short rubber sheets and 8 with long rubbers. The change of the rubber sheets caused a significant change in the performance at the tibia 4 sensor. In addition, the performance had changed with the last test after the legform had been disassembled and reassembled. Mr. Burleigh asked whether disassembly and reassembly followed the latest version of the owner's manual and whether additional shims were used. Mr. Zander and Mr. Kinsky explained that the assembly followed the earlier version of the owner's manual since the latest version had not yet been available. The assembly was done by a well-experienced employee (who usually does this at BAST's lab) and therefore no influence due to this is expected. The details of disassembly and reassembly had been presented with document GTR9-1-04. For the reassembly, no new parts were used. Mr. Burleigh added that for a reassembly shim fit should always be checked as this guarantees the adaptation to the actual wear.

Mr. Knotz pointed out that the test results in the presentation only show slight differences in the performance of the tibia 4 sensor and that therefore different performances with different rubber layers cannot automatically be concluded. Mr. Burleigh offered to present more details on this later in the meeting.

Mr. Zander presented document GTR9-3-05. He explained that during the inverse certification impactor SN-04 several times failed to meet the corridors at the tibia 4 sensor as well as for the ACL string potentiometer but also in few cases for tibia 3 and PCL. Comparing the performance of SN-04 with SN-02 it can be seen that curve characteristics during the tests are quite comparable.

Mr. Edwards wondered whether shear stress in the knee element may cause the shifting of the calibration results. Dr. Konosu replied that such a tendency can be seen with all impactors over time. Also, the inverse test configuration may cause some deviations. Mr. Edwards furthermore wondered whether slight differences in the impact speed during the inverse test may be the reason and whether the speed could be “normalized”. Mr. Zander explained that also for the speed tight corridors exist and that some scatter may be caused due to this. However, this is exactly the same what can be seen during vehicle testing.

Coming back to the question on the influence of the length of the rubber sheets, Mr. Burleigh presented document TF-RUCC-2-05. There, on slide 4 of 11 the results of Humanetics’ investigation on the influence of the rubber length during the inverse certification tests had been presented. Mr. Burleigh explained that the short rubber sheets cause higher peaks of the bending moments at the tibia 3 and tibia 4 sensors. Mr. Hess wondered which test rig was used for the inverse tests as the Humanetics test rig was identified during the TF-RUCC activities to have some problems. Mr. Burleigh confirmed that this test rig was used but stated that this should not influence the general findings here. Mr. Knotz added that the test results shown in document GTR9-2-10r1 show an opposite behavior. Therefore, it remains unclear what causes the differences. However, in the discussion on this it was stated that the vehicle styling of course has significant influence on the respective test results and that a closer look into the discrepancies reported in document GTR9-2-10r1 still seems necessary.

9.3. Further information, if available (All) (document GTR9-3-06)

The BAST proposal of a future vehicle test matrix was presented by Mr. Zander. The chair asked attendees to support the test activities.

On request of Mr. Broertjes (European Commission) Mr. Zander explained that a comparison of the performance of the different build levels of the FlexPLI will be possible. The chair added that tests will be done after the finalization of the TF-RUCC discussion and that it will allow the assessment whether the impactors’ performances are identical and can be finally used for vehicle testing.

Dr. Ries explained that OICA members need to understand whether the new impactor can be used for vehicle design processes. This can be done only if also testing of vehicles with the master impactors is done within the activities of the Informal Group. However, vehicle manufacturers need to assess the test matrix internally and therefore cannot finally decide on this right now.

Mr. Hess wondered whether industry can support the tests with in-house tests outside the planned test series. Mr. Kinsky pointed out that this finally means that it needs to be known which impactors have which build levels or whether other impactors have the same build level as the master legs. Mr. Burleigh explained that besides the three master legforms no other impactor by now was modified to the latest build level and that in any case an impactor would need to be stripped down, then to be certified on component level (using the latest procedures) and finally to be reassembled (also following the latest procedures) to guarantee that the same build level can be achieved. It may also be needed to replace parts for this, especially since the strain gauges now have a new sensitivity. Mr. Kinsky was wondering who covers the cost for a respective update and Mr. Burleigh reminded that there was an agreement to update for free only the three impactors that are used now as master legforms. After further discussion it was agreed that Mr. Burleigh will provide more detailed information on the updating of impactors (time, costs, check list etc.).

Ms. Chaka requested to add the information on the bumper height to the information on vehicles tests that will be shared finally. Also, she requested to include a pick-up truck with no real fascia. Both items were agreed.

Ms. Versailles stated that the US also is interested in supporting the testing but needs to postpone their testing to October the earliest. The chair confirmed that this still meets the schedule of the Informal Group.

Dr. Konosu explained that Japan has collected many experiences with testing the legform and is fully convinced that it can be used for vehicle design. Therefore, Japan does not see an urgent need for further tests in Japan for the time being.

Mr. Yoon (KATRI) stated that Korea would also be interested in supporting the activities.

On request of Mr. Zander and following some further discussion it was agreed that

- First the TF-RUCC activities will be finalized before any vehicle testing starts,
- Based on TF-RUCC findings, preliminary corridors will be agreed,
- Impactor certification before vehicle tests will follow the TF-RUCC recommendations,
- Vehicles will be tested according to a test matrix after being agreed,
- Details will be checked and discussed in the September meeting,

- If the TF-RUCC activities will be finalized before the September meeting it would be acceptable to already start the vehicle testing before the September meeting to save time.

Finally, Mr. Hess requested to add an agenda item on the simulation model to the agenda of the next meeting since the simulation model is urgently needed for the verification of test results. However, the secretary reminded the group that this item actually had been closed during the Osaka meeting (see minutes on agenda item 12 of the 2nd meeting, document GTR9-2-02r1): New information cannot be expected until the hardware impactor has been finally agreed and Humanetics as manufacturer of the legform has already announced to take up the respective activities again as soon as the hardware status is clearer. It was therefore agreed to not take this item up already during the next meeting but to review the status later during the work of the Informal Group.

10. Update on the FlexPLI design and PADI (action items A-2-08 and A-2-12) (Humanetics) (document GTR9-3-04)

The chair pointed out that the latest version of the owner's manual, called revision C and representing the status of August 2011, had been shared (see document GTR9-3-04). Mr. Burleigh added that revision D is currently under preparation and should be available by end of June 2012. However, with this he has two questions:

- Which certification corridors should be mentioned when revision D is shared?
- Should the mass of the moving ram impacting the legform include the mass of the honeycomb structure?

Mr. Burleigh explained that the latter question came up during the testing of the master legforms at JARI and needs to be solved preferably on short notice. Dr. Konosu added that (on page 71 of 79 of the owner's manual revision C) the mass of the moving ram for the certification test is specified with 8.1 +/- 0.05 kg. However, some labs consider the mass of the honeycomb structure within the mass while others do not include it.

Mr. Zander stated that – when drafting the description of the test equipment - the specified mass of 8.1 kg for the moving ram was not precisely allocated and that the honeycomb structure was not listed separately. This structure has a mass of approximately 100 g. Consequently, the total mass of ram and honeycomb should be 8.2 kg +/- 0.05 kg. Alternatively, the mass in the drawing could be specified as mass of the “moving ram without honeycomb structure”.

Mr. Knotz wondered whether this had any influence on the certification test results with the three master impactors. Dr. Konosu explained that one Japanese lab tested with exactly 8.1 kg for mass of ram AND honeycomb structure and this should preferably be considered to avoid that test results cannot be considered. Dr. Ries proposed to separately specify the masses of the ram and of the honeycomb structure. Some discussion on this came up and it

was finally agreed to use 8.15 +/- 0.1 kg (including the honeycomb structure) in the drawing since this includes all current test results.

The discussion returned to the question of the certification corridors: Mr. Burleigh was wondering which of the corridors should be used for the upcoming revision of the owner's manual. The chair pointed out that it had already been agreed earlier [note of the secretary: under agenda items 8 and 9.3] that the discussion in TF-RUCC needs to be finalized first. However, obviously no one should have concerns if Humanetics produces new legforms with or updates existing ones to the same build level as the three master legforms and already uses for the certification those corridors that result from TF-RUCC discussion. It was finally agreed to use the corridors agreed in the TF-RUCC as soon as the discussion there is finished.

Mr. Knotz requested to also add the friction of the moving ram to the specifications since this has an influence on the speed achieved by the ram. On request of Dr. Konosu he also explained that the friction can be easily checked with force measurement devices. Finally, he stated that other legislation e.g. FMVSS 226 consider this to be necessary. Discussion came up on whether the friction finally could influence the speed. JARI, Bertrandt and BAST did not see the need for consideration of the friction; however, after some discussion Mr. Knotz volunteered to prepare some more information on this for the next meeting.

Regarding the drawings (see action item A-2-08), Mr. Burleigh informed that his management agrees in principle to provide drawings as it is done e.g. for the Q dummies. However, Humanetics feels unclear on which information is needed on the drawings or what differences are made between "manufacturing drawings" and "engineering drawings". Mr. Burleigh feels that tolerances would be needed on both types of drawings to assure the performance of the impactor. Ms. Versailles added that she also is not aware of those details but that there was a longer discussion in the headrests and that during the latest GRSP last week the issue of the so-called "Special Resolution No 2" had been discussed (see document GRSP-51-37). It was finally concluded that the chair will contact Mr. Frost (U.K. DfT) for more explanation on the details.

Mr. Burleigh promised to provide the drawings with the disclaimer after the 4th meeting of the IG GTR9-PH2.

11. Status of discussion on the legform test area: establishing/activities of the new "Task Force Bumper Test Area" (action items A-2-13 and A-2-14) (European Commission, all)

Mr. Broertjes explained that the Commission has initiated a framework contract. With this contract, the Commission will be able to conduct activities (including testing) with a contractor. However, Mr. Broertjes outlined that the Task Force also needs to consider the findings of Euro NCAP, the concerns of the US and other information. Also, some testing may be done and this testing should then also be done with the legforms used currently in TF-

RUCC. This may finally depend on the availability of the legforms.

On request of Mr. Zander Mr. Broertjes confirmed that also a review of accident data should be included.

Mr. Broertjes agreed that the action items on this subject (A-2-13 and A-2-14) will be maintained and should be discussed during the next meeting. However, he apologized in advance that he may not be able to attend the September meeting but promised to keep the Informal Group informed.

Finally, Mr. Broertjes concluded that the secretary of the IG agreed to also support the Task Force Bumper Test Area (TF-BTA) and that further information of the TF-BTA will be shared initially via the distribution list of the Informal Group. If attendees wish to have further people added to the mailing list specifically for this item they should indicate this to the secretary.

12. Consideration of activity list, work plan and identification of further open issues (document GTR9-C-07r1)

The chair reviewed the action list of the Terms of Reference's document. He pointed out that several action items have already been worked at but some further action is necessary. Specifically, the following items need to be still finalized:

Activity item 1b – assessment of biofidelity – is ongoing.

Activity item 1c – assessment of benefit and costs – is ongoing.

Activity item 1d – technical specifications and PADI – will be discussed at the next meeting.

Activity item 1f – covering details of test procedure – still needs to be reviewed and discussed. This subject will be on the agenda of the September 2012 meeting of the Informal Group.

Activity item 1g – certification tests – will be finalized before the next meeting.

Activity item 1h – the review and exchange of test results – is ongoing.

Activity item 1i – the evaluation of reproducibility and repeatability – will be further be reviewed during vehicle testing.

Activity item 1j – evaluate and decide on performance / injury criteria and threshold values – as well as activity item 1k – evaluation of vehicle countermeasures (assessment of technical feasibility) – will also be discussed in September. OICA promised to provide some information on activity item 1k.

Activity items 2 and 3 – Draft proposals for amendment of gtr9 and UN Regulation on Pedestrian Safety – still outstanding.

13. Consideration of schedule (document GTR9-C-07r1)

The schedule of the Informal Group's work was reviewed. The chair expressed his optimism that the overall schedule can be met. However, details can be re-discussed at the September meeting.

14. Review of action list

On request of the chair the secretary went through the action list of the 2nd meeting. All items were reviewed. In addition, all items resulting from the discussion during this meeting also were mentioned. The open issues of the action list (see section B of these minutes) will be discussed during the September meeting.

The secretary reminded all attendees that preparatory documents need to be shared with all members of the Informal Group 5 working days in advance at the latest and requested therefore to hand-in the preparatory documents in due time.

15. Next meetings (18 – 19 Sept. 2012, Washington D.C., venue tbc by NHTSA)

Ms. Versailles confirmed that the meeting will be at the DoT headquarters in Washington D.C. but the meeting room has not yet been specified. However, it was agreed that the meeting should be extended by 20 Sept. noon since several action items were assigned and especially the discussion on accident statistics and on the cost-benefit assessment may take some more time. Ms. Versailles will confirm this separately with the chair.

In addition, the chair announced that the 5th meeting is planned in December 2012. It would be probably a one day meeting in connection with the GRSP but the details need to be confirmed.

16. A.O.B.

None