

GRSP INFORMAL GROUP ON PEDESTRIAN SAFETY

7th meeting

Paris, 28 -30 September 2004

Draft detailed meeting minutes:

1. Welcome

The chairman, Mr Mizuno opened the meeting and welcomed everyone. He thanked OICA for hosting the meeting. Mr Mizuno stressed that this meeting should improve the draft skeleton gtr and hopefully finalise the task based on the results of the action plan of last meeting. He referred to the feasibility studies and the IHRA decisions which should help us to make some decisions. Also the group should discuss how to report to next GRSP (December 04).

Mr Van der Plas, reminded the group of the documents distributed prior to the meeting and relating to the agenda:

INF GR/PS/83	Decided items and action items of the 6th meeting
INF GR/PS/84	Draft meeting minutes of the 6th meeting
INF GR/PS/86	Draft gtr EU working document
INF GR/PS/89	EU Feasibility Study Phase 2
INF GR/PS/90	Provisional agenda for the 7th meeting
INF GR/PS/91	ACEA feasibility study Phase 2
INF GR/PS/92	ACEA equal effectiveness study Phase 2
INF GR/PS/93	Design of head impactor
INF GR/PS/94	Front windshield
INF GR/PS/95	JPN comment on PS 86 Rev 2 incl English translation of the Japanese technical standard
INF GR/PS/96	Problem of undamped accelerometer
INF GR/PS/97	Durability and repeatability of headform skin
INF GR/PS/98	IHRA PS 310 decision for legform test
INF GR/PS/99	Skin aging of head impactor
INF GR/PS/100	OICA proposed amendments to PS/95

2. Adoption of the agenda INF GR / PS / 90

The agenda was adopted.

3. Review of the minutes of the 6th meeting INF GR / PS / 84

INF GR / PS / 84 was adopted without comments.

4. Report on GRSP/35

Mr Van der Plas reported on last GRSP (May 2004). INF GR / PS / 88, the second interim report to GRSP was presented as informal document 4 of that meeting. Attached was document INF GR / PS / 86, the draft skeleton gtr. The document was presented by Mizuno san and he asked for comments on the working paper before September 2004. No comments were received. The chairwoman said that the approach with different options / tests / vehicle categories is complicated and it may be necessary to look at it in phases. She stressed that any comments are to be based on scientific facts.

Mr Van der Straaten stated that it is not very clear how such phasing should work since already this meeting has spent much time already on the scope / options / tests. Maybe the group should again explain the reasoning behind the approach used in order to keep the solution reached so far.

5. Report of various feasibility studies on the EU Directive Phase 2 and how to reflect the results in the draft gtr INF GR / PS / 89, 91 / 92, 101

Mr Doyle presented INF GR / PS / 89. The Commission was required to conduct a feasibility study into the applications of Phase 2 of the Directive. Article 5 states that by July 1 such a study should be conducted looking into passive and active safety matters. The outcome should always at least be as effective as the Phase 2 as currently in the directive. So the study looked into the feasibility and effectiveness of safety solutions. TRL carried out the study on behalf of the Commission. In parallel ACEA carried out two studies: one on the feasibility of Phase 2 and one in relation to an active safety technology which could offer the best benefit: brake assist systems (BAS). Additionally JAMA also performed a feasibility study. All documents are available on the EU website and are open for remarks.

The resulting proposals to change Phase 2 will make Phase 2 feasible and are justified cost-benefit wise. Systems like pop-up bonnets are not developed enough to take into account in the evaluation. The cost benefit ratio is 1:5,4 for the changed Phase 2 and 1:5,8 for the changed Phase 2 + BAS. The conclusion is that BAS should be made mandatory but should not replace Phase 2 of the directive.

ACEA also sees problems with the feasibility of Phase 2 and is also looking at BAS. However the ACEA figure for BAS is an effectiveness of 133% whilst the EU study showed 85% effectiveness compared to the current Phase 2. ACEA and the EU contractor are looking at these differences and the outcome is not known yet. Results expected early November.

Mr Mizuno asked if the report will be changed if comments are received.

Mr Doyle said that the ongoing discussions (on feasibility and the equivalence) might result in an addendum to the report which could include revisions to the proposals. However, he stressed that a legislation exists. All the Commission should do is a study. If later on the Parliament and Council consider that the resulting proposal is not of equal effectiveness to the current Phase 2, the Commission will have to redo its work. So a Commission proposal to change Phase 2 will only be put forward if they are sure that they can prove the proposal is of at least an equal effectiveness of the current Phase 2.

Mr Youn stated their first impression is that the proposed changes are reasonable however they still have some remark about the head speed and angle.

Mr Césari said that for the bonnet leading edge it is clear that most of the vehicles do not cause injuries to the upper leg. The question is why we should change the cars to meet a test whilst there is no need based on accident causation. Such comments could be written and provided to the Commission if this would be helpful. When looking at priorities, the upper leg test is of a low priority since there is a big gap of what is required and what is needed.

Mr van der Straaten underlined the comments of Mr Césari as these are in line with the comments of the GRSP chairwoman: comments should be scientifically based. We should also review what is really needed. Accident data show no need for an upper leg test and this should be very carefully considered.

Mr Mizuno agrees, this group should make a proposal based on scientific data.

Mr Bilkhu asked if the tests included in this proposal are there because of historical reasons or is there another thought behind it.

Mr Doyle explained that many years of work were put into pedestrian protection mainly by EEVC WG10 and WG17 which developed into the known sub system tests. These were agreed and brought forward in legislation. Before that there was the voluntary agreement and these were signed up and agreed by ACEA, JAMA and KAMA. It were these tests which on request of Parliament and Council were copied into the Directive. If one of these tests need to be removed, there needs to be a very good justification.

Mr Bilkhu asked of EEVC WG 17 is re-evaluating accident data to check the need for the upper leg test.

Mr Doyle said that the EU and EEVC have not been in contact to discuss this.

Mr Kinsky presented INF GR / PS / 91. The feasibility study was done in collaboration with MATRA and TNO. Various vehicle models were evaluated and changes to the cars were made in an attempt to make them comply with the Phase 2 requirements. The main conclusion is that Phase 2 is not feasible. The full report is not available at this time since it includes specific information of 4 models of 4 different manufacturers. If there would be a need to have the full document first the agreement should be received of the 4 manufacturers to open up their data.

Mr Youn said some simulation was done with full Madymo dummy. Can it be verified if there is contact with the pelvis?

Mr Ries replied that indeed there was contact but the simulation dummy was not developed to evaluate pelvis injuries.

Mr Ries presented INF GR / PS / 92. The equal effectiveness study was performed by Technical University of Dresden. The study amongst others include data showing that for vehicle speeds up to 40 km/h and car models younger than 1990, there are no injuries to the pelvis. For car models younger than 1996, there are no injuries at the pelvis irrelevant of the car speed. For BAS, the study concluded that for seriously injured pedestrians the Phase 1 + BAS effectiveness is 115% (if the current Phase 2 is 100%). For fatalities the effectiveness of the Phase 1 + BAS

effectiveness is 133% (compared to 100% for the current Phase 2). The data also showed that with BAS, 56 out of a total of 712 accidents can be avoided.

Mr Saul asked if there is data in how many cases the brakes have been applied in pedestrian accidents.

Mr Kinsky explained that the GIDAS data uses a complete set of data. Only if the set of data is complete, the accident is in the database. For the 712 accidents in the database which were relevant for this study, it was known if brakes were applied or not. So this factor was taken into account in the calculations.

Mr Saul asked if it was by interviewing of drivers.

Mr Kinsky said it is by interview of drivers, witnesses, skid marks.

Mr Saul asked if it was also made sure that cases where braking occurs after the pedestrian was hit were excluded.

Mr Ries confirms this. In total 47% of all cases the braking was applied.

Mr Youn asked what the 712 accidents represent.

Mr Ries clarified that the complete dataset is 1153 cases. However, looking at the data needed for this research only 712 accidents were relevant (front impact, ...). He also clarified that it was assumed if a deceleration of 6 m/s² was achieved, BAS would be activated.

Mr Tanahashi presented INF GR / PS /101. The study was performed by JARI and looked at the headform to bonnet top test. Amongst others modifications were suggested to make the bonnet hinge comply with Phase 2, however the showed to be not feasible because of other requirements which could not be met anymore (durability for bonnet closing, bonnet performance in front impact). For the upper leg test the study concluded that according to EURO-NCAP results no car can pass the Phase 2 requirements however, there are almost no pelvis injuries found. This means that the upper leg test is contradictory to the actual situation in real world accidents. The study also questions the biofidelity of the impactor.

6. Results of the action items and how to reflect these in the draft gr INF GR / PS / 83, 94, 101-106

Mr Mizuno introduced action item 1 of INF GR / PS / 83 (head test area proposal). INF GR / PS / 94 from Japan is the answer to this item and was presented by Mr Ishikawa. The paper documents results of J-NCAP windscreen impacts. Additionally there were problems with these tests. When undamped accelerometers were used, some very high values were recorded. This will be addressed in a later study (INF GR / PS / 96).

Mr Ries asked if the target point A is the aiming point or the point of first contact.

Mr Ishikawa confirmed it is the aiming point meaning the impact point is some millimetres lower.

Mr Kinsky presented INF GR / PS / 102 which backs up the presentation done by Mr Ishikawa and includes test results of EURO-NCAP testing. He added that these results underline the proposal made by OICA last meeting on the definition of the windscreen test area.

Mr Frederikson showed results of a large executive car tested in the windscreen area (INF GR / PS / 103). For impact points 82,5 mm away from the A-pillar the HIC level was well below a HIC of 1000. Impacts on the A-pillar at 20 km/h HIC values of 1400 to 1600 were recorded.

Mr Mizuno introduced action item 2 of INF GR / PS / 83 (selection of impact points). As there is no paper Mr Mizuno suggested to deal with this issue when going through the draft gr (item 7 of the agenda). This was agreed.

Mr Mizuno introduced action item 3 of INF GR / PS /83 (head impact angle and speed). As there is no paper related to this action item, this will be dealt with under agenda item 7 as well. Mr Doyle noted that especially the speed is still a problem for the EU.

Mr Mizuno introduced action item 4 of INF GR / PS /83 (head impactor specifications). Mr Doyle confirms for the first sub issue in the future the brackets for the adult head weight could maybe be removed but not just yet. For the other sub issues of this action item following papers were presented by Mr Ishikawa: INF GR / PS / 93, 96, 97, 99. Conclusions amongst others were that the damped accelerometer should be used.

Mr Ries asked if the signal compared is only the one of the main axes. Mr Ishikawa confirmed this.

Mr Frederikson asked if an ACEA headform was tested in the same configuration to check if it has the same problem. Mr Ishikawa confirmed this.

Mr Ries said that in their testing this problem has not been found yet (damped / undamped).

Mr Ishikawa explained that the undamped accelerometer has a mechanical stopper. The original accelerometer had a mechanical damper which was often damaged, hence the accelerometer was changed to an undamped version.

Mr Ries asked how much the damped accelerometer should be damped. Mr Ishikawa explained that the damped accelerometer has been used since 20 years in Japan without problems.

Mr Minne explained that EURO-NCAP recommends not to use the undamped accelerometer for the same reason.

Mr Youn is concerned about the difference in specifications in PS/93 (10 mm versus 30 mm distance between SML and GeC). If a small damped accelerometer would be available there would be no need to change to 10 mm to 30 mm. Mr Ishikawa said work is ongoing on a smaller version.

Mr Youn also asked to clarify if the same result is found when tested with both headforms. Mr Ishikawa confirmed this.

Mr Saul asked how much detail the gtr requires.

Mr Doyle answered that a test tool will have to go through a certification process. This problem could mean that the certification process should be much tighter.

Mr Saul replied that the certification procedure may not pick this problem up as it does not occur every time.

Mr Mizuno said that the tables and drawings as in PS/93 would be enough; however, he is not sure if this is sufficient for the US as they usually have very detailed specifications.

Another conclusion was in relation to skin ageing: over a period of 25 months is not significant.

Mr Langer confirmed that the ageing was related to time, temperature and number of drop tests. Mr Ishikawa confirmed this.

Mr Youn asked what the extremes for temperature were. Mr Ishikawa explained this depended on the climate meaning 0 to 35°C and humidity of 20 to 90%.

Mr Ries asked if during the drop test, the same point was tested every time. Mr Ishikawa confirmed this.

Mr Frederikson asked what the effect would be when tested on the bonnet (instead of drop test). Mr Ishikawa said there would not be an effect at all.

Another conclusion is that durability and repeatability of the headform skin is satisfactory. Certification tests could be done at intervals of more than 20 impact tests. This data can be used to decide how many times an headform can be used before certification has to be done.

On another issue, Mr Ishikawa said that for accelerometer location three reports were published at IHRA (documents 217-219). Mr Mizuno explained that based on these documents IHRA decided the tolerance however, there is no need to explain everything in this meeting.

Mr Mizuno introduced action item 5 of INF GR / PS /83 (editorial changes). Not relevant anymore as the draft gtr document has evolved since.

Mr Mizuno introduced action item 6 of INF GR / PS /83 (active bonnet test method). Mr Kinsky explained INF GR / PS /104. This is a draft CLEPA / OICA document which is still under discussion in order to make sure that the tests proposed represent the worst case.

Mr Mizuno said that since this is a new area so it requires more study. So when finalised, everyone should review.

Mr Kinsky said the work will be finished in due time before next meeting.

Mr Mizuno introduced action item 7 of INF GR / PS /83 (lower leg anthropometry decision, no action).

Mr Mizuno introduced action item 8 of INF GR / PS /83 (lower leg test speed decision, no action).

Mr Mizuno introduced action item 9 of INF GR / PS /83 (lower leg impactor). Mr Ishikawa presented INF GR / PS /98. This includes changes to the test setup and the biomechanical corridors agreed. (Note from the Secretariat: in the document on several pages it is stated that the “corridor is adapted”. However, during the meeting it was clarified that throughout the presentation this should read “corridor is adopted”).

Mr Mizuno clarified that this work relates only to lower bumper cars. IHRA still has to start discussions on high bumper cars.

Mr Césari clarified that every corridor relates to a specific test condition. Then the actual test set up is workable, repeatable, ... IHRA still has some disagreement if a deformable thigh is needed since for this case we are looking at impacts on or below knee level. If not, a corridor is not needed either. There are some concerns about the knee as well: the loading process inside the knee may be artificially controlled because the axial rotation in cadaver legs go up to 15° and this should be considered in IHRA as well as it can effect the injury risk curves. Additionally the corridors are so wide that IHRA will have to consider why this is. Two tools which have completely different behaviour could fall inside the corridors. Clearly this needs to be addressed.

Mr Mizuno said that even with the wide corridor, it is already difficult to comply. Additionally IHRA can not provide the certification tests as each impactor comes with different certification tests.

Mr Césari showed INF GR / PS /105 explaining the corridors. The peak of the force corresponds to a knee angle of 20° (for a 50% risk). However, these results are without action of the muscles. The muscles generally stiffen the knee and this is not taken into account at this time. Simulation work is ongoing to verify this as the current numbers may be too low. Similarly for the orientation of the ligaments the shearing value should probably be around 10 mm (ligament itself is 14 mm but is not in same direction as the movement of the bones).

Mr Ries asked if it is possible to interpolate this to a 40 km/h test speed (for the research the speeds were 15 and 20 km/h). Mr Césari said this was checked from 2 to 10 m/s and no change was seen, the ligaments behave in the same way in this speed range. So yes. For the corresponding force it may be different because of inertial effects. However the angle is used for the tolerance and not the force.

Mr Ries remarked that if these corridors have been adopted by IHRA, does this mean that IHRA recommends impactors that can bend in the tibia and femur area? If so, the current (TRL) rigid impactor can not be used.

Mr Mizuno said it is an IHRA recommendation. Based on that recommendation a discussion is needed in this group.

Mr Césari said one has to differentiate between tibia and femur. It may not be necessary to have a deformable femur, this is not decided yet. For the tibia, there is an IHRA agreement that a deformable tibia is better (more biofidelic) than a rigid one. Additionally the loading in the knee becomes more realistic.

Mr Mizuno confirmed this; however this group should not only look at biofidelity but also to many other parameters like impactor availability.

Mr Ishikawa explained the biofidelity rating of the FlexPLI (2003 version) using the Ruhle-Maltese method which depending on the corridor ranges from good to excellent. Mr Mizuno asked if the 2004 version is better. Mr Ishikawa replied that the 2004 version is even better (more in the centre of the corridors).

Mr Ishikawa presented INF GR / PS / 106 answering various issues of this action item relating to the FlexPLI. The study includes tests on repeatability, re-produce-ability, useability, comparison between rigid legform and FlexPLI. J-MLIT recommends to use the FlexPLI in the legform test.

Mr Notsu clarified that only one car model was used in the study and not two.

Mr Mizuno asked about the availability of the FlexPLI.

Mr Ishikawa replied that the cost is about 3,2 million Yen excluding handling fee for export. It can be purchased at S-TECK and is available for everybody (Note by the secretariat: S-TECK Corporation Tel: +81 493 62 4505; fax: +81 492 62 4598 Address: T355-0203, 85 Katsuta, Arashiyama-cho, Saitama, Japan; e-mail: niimura-k@s-techinc.co.jp with cc to hishikawa@jari.or.jp).

Mr Mizuno asked what difference is between 2003 and 2004 year model.

Mr Ishikawa explained that after some users had ran tests, there were remarks on the useability and this was improved in the 2004 year model.

Mr Césari explained that in reality a lot of the deformation comes from the flesh. The question is since the FlexPLI has all the deformation in the bone (as it does not have flesh, only a thin skin). So do we need a deformable bone or more compliant flesh. This could be researched with a good biofidelic FEM.

Mr Ishikawa explained that the biofidelity test was good for the FlexPLI.

Mr Césari asked if it was also checked what the sensitivity is when the impact point on the bone was changed.

Mr Ishikawa said this was done and it gave the same result.

Mr Césari does not agree completely with the conclusion that the rigid legform has insufficient injury assessment as it does record the injury knee parameters that were set out to be measured.

Mr Mizuno agrees that this remark should not be on this conclusion slide. EEVC was also asked to show a similar set of tests. This was specifically asked to EEVC and the EU.

Mr Notsu underlined that the best available impactor for biofidelity is the FlexPLI. So the J-MLIT would like to propose to only use the FlexPLI in the gtr in the future.

Mr Kinsky said that the EU industry fully disagrees that this impactor is available and does not want it in the gtr as the only impactor.

Mr Ries asked if repeatability tests were done on the car. Mr Ishikawa said this was done on one car.

Mr Ries said the gtr includes many different vehicle models, this should be checked.

Mr Ishikawa said this is a budget issue.

Mr Tanahashi said that JAMA has not finished its study on the FlexPLI yet but does believe that the biofidelity is better. He added that big investments are needed to comply with the pedestrian tests. If meeting tests does not offer the best effect on the road, there is no will to invest the money, so the best possible impactor should be used in the future.

Mr Mizuno asked Mr Kinsky to clarify.

Mr Kinsky said the leg itself is not opposed to but it is not regulatory ready as the only test tool. First all manufacturers should have the chance to build experience.

Mr Ries asked if sensitivity during the subsystem test has been checked as well. All of these issues should be very clear before the FlexPLI can be put in the regulation.

Mr Langer asked when the FlexPLI will be ready for series production and availability throughout the world.

Mr Ishikawa said some sort of round robin testing may be necessary, as only a limited number of users are working with the FlexPLI now. He added that the rigid legform was available only 2 years ago so in 2 years time industry was confident to work with it.

Mr Langer said this would put us in 2007.

Mr van der Straaten said we will have to work in steps. The rigid legform is ready today, the FlexPLI will be tomorrow and which one is the best will be the day after tomorrow. That is why OICA proposes to have both in the gtr at the choice of the manufacturer which will allow building up more knowledge and allowing comparison at a later stage to decide on a final and only legform. This approach can be very well explained in the preamble.

Mr Lukaszewicz supports the proposal of Mr van der Straaten.

Mr Mizuno concluded that more time is needed to monitor the FlexPLI.

Mr Césari said that if there is a need to change the characteristics of the rigid legform it is possible. Also changing to a deformable tibia could be done if the impactor has to fulfil a certain specification which was not the specification at the time of development.

Mr Saul came back to the issue raised by Mr Césari on what the flexible part of the leg is: the flesh or the bone. And do the two different devices drive the design changes in the same direction.

Mr Notsu said that if a monitoring process is proposed, this work should be finished before the adoption of the gtr so that the gtr can include only one impactor.

Mr Youn asked if the rigid legform design is frozen or are improvements underway.

Mr Césari said that currently there is no request for improvements.

Mr Youn said that the gtr should be based on scientific findings. If the rigid legform is not sufficiently biofidelic and everyone agrees to this, why should we continue to take the rigid legform into account.

Mr Mizuno agrees in principle but we should also take into account availability and the time schedule of the gtr.

Mr Kinsky said that at the time of development of the rigid legform the idea was to look at knee injuries as these are the most severe injuries. If now also bone fractures are to be taken into account more work is needed. Industry fully supports further development of impactors but this needs time.

Mr Mizuno said that the timing of the gtr is such that our decisions should be final late January or early February next year in order to be on time for the May 2005 GRSP as was set out at the start of the informal group.

Mr Césari said that one impactor seems to be biofidelic and the other one not which may be a falls impression as the biofidelic evidence is weak on certain aspects. However, when going back to the muscle issue as mentioned before it may be that the FlexPLI is less biofidelic than the rigid impactor. Additionally there is the issue of deformation by the flesh or the bone. So it is impossible to choose today as these issues need to be resolved first at IHRA. Have IHRA decide on the exact biofidelity, give the time for the two impactors to be adapted to these new specifications and then do a round robin test. The best solution today is to keep the two and perform a real round robin test and GRSP can play a role in this.

Mr Mizuno asked if EEVC has similar information for the rigid legform as requested in the action plan.

Mr Césari said there is no presentation as the legform is very well known today and part of the Directive and widely used by the industry and EURO-NCAP. So there is nothing specific to say.

Mr Mizuno explained that the group will need to have background information and also why certain limits were selected. This information is needed for the gtr.

Mr Césari explained that when the impactor was designed, the target was to look at knee injuries. This is because research showed that knee injuries can result from bending and shearing. This is still considered to cover the mechanism of the knee injuries. The force deflection characteristic was decided on information of that time. If there is a new target that gives us enough confidence, which is not the case today, this can be adapted. Secondly the bone acceleration is measured as it was believed to be a good indicator for the violence of the impact. The principles, especially for the knee, are still good.

Mr Ishikawa said the rigid impactor was studied for many years and many problems were found especially in measuring. For example the shear springs can not measure the actual displacement at certain conditions. So the output of the shear displacement is questionable. A presentation is available at JSAE.

Mr Césari said this is something that could come out of a round robin test.

Mr Mizuno confirmed that there is a certification test for the FlexPLI.

Mr Césari added that a certification test is present in the EU Directive.

Mr Mizuno introduced action item 10 of INF GR / PS /83 (feasibility studies on FlexPLI). No information is available.

Mr Mizuno introduced action item 11 of INF GR / PS /83 (actions necessary for having a document for GRSP/34, May 2004). This action was finished in time before GRSP/34 resulting in the informal document presented at GRSP/34 (see item 4 above).

Mr Césari asked to reconfirm the issues discussed in this agenda item:

- accelerometer location in headforms: ± 10 versus ± 30 mm in the direction of the acceleration: Mr Ishikawa said that the size for the damped accelerometer is important. As this is in the direction of acceleration it may not be so important. The group agreed to put [± 30 mm] and everyone to check by next meeting amongst other what the effect is on different shapes of cars.
- adult head mass: 4,8 versus 4,5 kg. The brackets ([4,8 kg]) will be kept for the time being in order to give the EU sufficient time to come to a position.
- active bonnet system testing: CLEPA / OICA will continue its work and a document will be ready by next meeting.
- lower leg: Mr Césari explained that IHRA is confident that the legform is useable if the impact is on the knee or below. As the knee is 513 mm above the ground, there are uncertainties on the test results. Mr Mizuno added that this relates to the definition of the high bumper car. Mr Ries said this is under discussion within the industry. Also

the EU feasibility study proposes some changes. A criterion to distinguish between high and low bumper is under discussion in OICA and will be proposed by next meeting. Mr Césari asked if for the FlexPLI a similar limitation exists. Mr Ishikawa confirmed this is the case and it is in the same range. Mr Césari added that measurements could be made on the femur by strain gauges and asked if this could be used to replace the upper leg test. Mr Ishikawa said this is under study but can not guarantee this will be ready for next meeting. Mr Mizuno said that IHRA has just started discussions so if IHRA can not agree soon, there will be no result in time for next meeting. Mr Césari added that as the lower part will be protected (a test will be included), the same should be true for the upper part of the leg. However this still needs to be developed and is not easy to do. Mr Kinsky said that for the short term the only possible solution may be to use the current existing upper leg to high bumper test.

Mr Césari asked if any of the governmental delegates have a position on this high bumper issue.

Mr Lukaszewicz said his preference would be to keep the EU provisions for the time being until IHRA has finished its work. Mr Césari concluded that the EU method to test the high bumper with the upper leg form should be used and that for the long term consider the results of IHRA. Mr Notsu said we should wait for the outcome of IHRA. Mr Césari explained that IHRA starts from almost zero and it will take long time before something will be fully ready. So what shall be done in the mean time. Is it acceptable to use the EU method on the short term.

Mr Youn said that Korea gives equal importance to high and low bumper. So he agrees to use the EU procedure for the short term and change to IHRA at a later stage.

Mr Saul explained that in the US there is a voluntary agreement on compatibility to have similar bumper heights and this may mean the disappearance of high bumpers. Additionally NHTSA prefers the gtr to be IHRA based. And to conclude the EU impactor clearly is not biofidelic as explained at the last meeting so he would prefer to wait for the IHRA results.

Mr Césari explained that there is a difference in biofidelity in upper leg to high bumper test, which is a point impact, whilst for the upper leg to bonnet leading edge the impact is over a much larger area in reality and this is not represented in the test. So for the upper leg to high bumper test the test represents the actual accidents much better.

Mr Kinsky said this is also the industry's point of view.

Mr Césari said that the gtr will include the EU procedure for the high bumper for the short term and later on move to the IHRA result.

- bonnet leading edge test: Mr Césari said it was shown that injury numbers are much less important. There could be cars where there is a problem. Additionally there are many doubts about the test itself as it is not representing the actual accident biomechanics (the upper leg impact is a guided impact to one point whilst in accidents one clearly sees a sliding movement upwards over the bonnet leading edge).

Mr Lukaszewicz said that this test could be kept for monitoring only as this would offer the opportunity to develop and improve the test further.

Mr Ries said care should be taken on the test representativeness and on the tool itself. And moreover if accident statistics show there is no need, there should not be a test also not for monitoring.

Mr Saul said that he had not seen at this stage any proof that such a test is needed. IHRA should discuss this and when they are ready restart the discussions at that stage.

Mr Mizuno said that one of the first decisions was that head and lower leg are the priority. However, the EU would like to include the upper leg requirement. In the preamble we should give the justification for the test.

7. Review of the draft gtr INF GR / PS / 86 / Rev 2

The meeting went through INF GR / PS / 86 / Rev 2 page by page.

Page 3: preamble. Mr Mizuno explained that NHTSA made a guideline proposal for the preamble part and asked the group to comment on this before next meeting. One or more volunteers are needed to draft the actual text for inclusion in the gtr next meeting.

This proposal was confirmed by Mr Saul. NHTSA has put together a rough guideline based on the 1998 Agreement and the door locks gtr preamble.

Mr Doyle agreed and said he might need the help of EEVC to provide additional backup data.

Mr Mizuno said that Mr Saul, Mr Doyle, Mr Notsu, Mr Césari, Mr Van der Plas and himself would work on the draft text. Additional volunteers are welcome. The draft text will be circulated one month before next meeting.

§1 – 2.1 no comments

§2.2 Mr Ries introduced the OICA comments which refer to table 1. The EU commented that such a text is not necessary in a legislative text as the text itself will have to be sufficiently clear.

§2.3-2.6 no comments

Table 1 EU commented that this is only an example of what the table could look like however nothing has been decided on the actual content. Additionally the 'derived from' principle has not been accepted yet. It is the approach

used in the directive but the categories for the gtr are dictated by Special Resolution 5 (common definitions) so it is not the final content of the table. Mr Doyle suggested to delete the 'derived from 1-1' in column c and d.

Mr van der Straaten explained that RE5 is setting a general framework for categories, masses and so on. Even the Common Tasks group could not conclude on a category 2-1 and 2-2. That is why there is only a general category 2 and it is up to each gtr to define it further if needed. It is not because 'derived from' is not included in RE5 that it can not be used. Every gtr can adapt the definitions as necessary. So it is not necessary to delete the wording 'derived from'.

Mr Mizuno confirmed that indeed in a gtr we can add a definition as necessary.

Mr Luckaszewics confirmed what Mr van der Straaten explained by RE5. Each gtr is free to subdivide the definitions in order to well define the scope.

Mr Notsu explained that also the Japanese standard uses the concept of 'derived from' so for Japan there is no obstacle to use it.

Mr Kim explained that Korea needs some further study.

Mr Doyle clarified that 'derived from' can be accepted if there is a very clear understanding what it means. At this moment it is not clear.

Mr Césari concluded to keep 'derived from' in brackets and OICA to come up with a definition on 'derived from'.

Mr Kinsky read how 'derived from' is defined in the Directive.

Mr Césari concluded that this is agreed for the group and the definition will be included under § 3.

Mr van der Straaten suggests to come back to the table after all technical issues have been solved in order to maybe find a more simple solution.

Mr Césari asked what category e is covering.

Mr van der Straaten said category e is covering all 'commercial vehicles' below 3500 kg.

§3 Mr van der Straaten explained that this sentence has the risk that for example a pop-up headlights to be in different positions in different Contracting Parties. The text as it stands is too subjective.

Mr Doyle explained that that this sentence covers for who makes the decision. It should remain in brackets for the time being.

Mr van der Straaten said that the text currently only works for type approval and mutual recognition where one authority makes the decision what is most appropriate. For the gtr at this stage there is no certification or mutual recognition and that is the problem for this sentence. He suggests to put the complete sentence in square brackets and come up with a better proposal by next meeting.

§3.1 Agreed including the changes as proposed by OICA and EU.

§3.2 no comment

§3.3 Mr Ries explains the definition was copied from the Japanese technical standard. See also discussions on §7.2.6.2 .

§3.4-3.5 no comment

§3.6 The OICA comment is deleted as there is no problem in relation to the Japanese technical standard.

§3.7-3.10 no comment

§3.11 Changes agreed in line with 3.1. The additional sentence proposed by OICA (covering for a change to the rear reference line) should be moved to §3.22 according to the EU as this defines the rear reference line. This was agreed.

§3.12 Editorial correction agreed.

§3.13-3.19 no comments

§3.20 Mr Ries suggested to add 'manufacturer' as he is the only one who can recommend the pressure of the tyres. The second change is in line with §3. This was agreed.

§3.21 Mr Ries explained that in the Japanese standard bus shaped cars are taken into account. So for vehicles with a vertical front it is better to use the vertical height of 1900 mm as a cut off instead of a wrap around of 2100 mm. This was agreed but with the wording of the EU.

§3.22 Agreed to add the sentence coming from 3.11.

§3.23 Mr Ries explained this definition still requires proper wording. The definition deals with the drawing 13a. Mr Doyle said the original idea was to run the sphere around the windscreen. This is reflected in the basic figure 13. The new figures 13a to c were proposed but were never discussed nor agreed. That is why all of the definitions referring to figures 13a to c the EU inserted a comment reflecting this. Mr Doyle recommended to have wording for the definitions necessary for figures 13a to c. However the EU thinks they can possibly agree on the side and top reference lines but not on the lower reference lines which is a different discussion. Mr Ries agreed to this. Mr Doyle asks for formal words reflecting figure 13a is put forward and placed in 3.23. The same should be done for the side reference line for the windscreen area 3.34.

Mr Clor presented INF GR / PS / 110 a proposal for the rear and for the side windscreen reference line. This was accepted for the rear windscreen reference line. For the side windscreen reference line there are two alternatives. One which uses an angle depending on the vehicle shape and the second one is irrelevant of the shape. Mr Césari concluded that the second alternative is kept.

§3.24 Mr Ries proposed to specify the length of the straight edge. This was agreed. Mr Doyle clarified that the bottom edge of the straight edge should be maintained 600 mm above the ground. This was agreed to be added as well.

§3.25-3.29 no comment

§3.30 Mr Kinsky said ‘running order’ is the proper term to be used. This was agreed.

§3.31 no comment

§3.32 Editorial changes were agreed.

§3.33 no comment

§3.34 see 3.23 above

§3.35 Mr Doyle stated that the height of the dashboard (as specified in figure 13 c) should not determine where the test area should be and certainly not with the sphere being inside the vehicle on the dashboard to determine the pedestrian impact area.

Mr Ries said that the hard parts should be taken into account. The dashboard is one of these hard parts.

Mr Kinsky said one other idea may be the approach of the Directive by using the field of view.

Mr Césari said this would result in excluding a zone between the bonnet test area and the windscreen test area.

Mr Kinsky said there are no technological solutions for this area so that exclusion zone is needed.

Mr Césari replied that the design should be pushed to safer designs.

Mr Doyle said that the dashboard is not necessarily a structural element of the car.

Mr Langer said that the forefront of the dashboard is connected to the firewall which is the most rigid part of a vehicle.

Mr Doyle asked if the definition should not refer to the firewall instead of the dashboard.

Mr Césari proposed to look at technical feasibility. EURO-NCAP has done tests in this area and it would be interesting to know if there are problems in EURO-NCAP.

Mr Kinsky referred to INF GR / PS / 102 which was presented before.

Mr Césari asks what the reaction of Japan is on excluding a zone between the bonnet and the windscreen area.

Mr Notsu explained that after looking at the J-NCAP test results (INF GR / PS / 94) Japan could agree to have some exclusion zone.

Mr Lukaszewicz said that the issue needs to be investigated more deeply as at this stage it is not possible to agree on it.

Mr Césari concluded that strong arguments will be necessary to have zones excluded from the head test area. A clear proposal should be ready by next meeting.

Mr Mizuno underlined that much depends on the test parameters as well: speed, injury limit, ...

§3.36 no comment

§ 4 Mr Césari referred to the discussion earlier where for the high bumper for a limited time until IHRA is ready, the EU upper leg to high bumper test can be expected. Concerning the upper leg to the bonnet leading edge test there is the idea that no test is necessary as it is not supported by accident research. IHRA will look at it and at a later stage that can be copied. Another possibility is to have the test included but as monitoring only.

Mr Doyle said that they don't want to lose sight of the upper leg to bonnet leading edge test. The feasibility study showed there could be still possibility to make the test feasible. He would prefer the second proposal (for monitoring) on the condition that there is a specified date included by when something has to happen. He therefore suggests to keep the test in at this time and decide later whether to keep it in for monitoring only.

Mr Mizuno explained the three problem areas: accident evidence, biofidelity of test and feasibility of the test. The last point is under review by the EU.

Mr Doyle agrees that one of the issues is the need for it. He argued that today there may not be a need for it however, in the not too distant future there might be. What if solutions to deal with the lower leg or child head test are detrimental for the upper leg. That's why the test should be kept. And yes there are some problems with the test but there is a point in time that you have to move forward and use it.

Mr Saul questioned what the proper place would be for this test in the gtr. The discussions on this test and the fact that IHRA will look at it could be put in the preamble and not specify the test in the gtr text itself. If such a test is inserted it needs to be scientifically based preferably when IHRA has finalised its work.

Mr Ries underlined what Mr Saul said. Currently we know that this impactor shows aggressivity whilst the cars on the road do not do that. It is just increasing the cost to the customers without offering benefits.

Mr Kinsky explained that we fully understand the concerns of the Commission. However the upper leg does not represent a pedestrian when tested on the bonnet leading edge. Further research is necessary to test the bonnet leading edge.

Mr Césari asked if IHRA can help to clarify our minds in the next IHRA meeting.

Mr Mizuno explained that IHRA started with the high bumper question however the bonnet leading edge problem is not under discussion yet. However if this group would ask IHRA then it can be included in the IHRA action plan if adopted by the IHRA Steering Committee.

Mr Ishikawa added that the EURO-NCAP test results showed that all cars failed the requirements. However, there are no injuries on the road relating to these cars. So it is now time to decide if the tool is useful.

Mr Césari explained that IHRA should look into the scientific evidence.

Mr Bilkhu asked what data is required by the Commission to make a firm decision on it.

Mr Doyle added that the feasibility study is still ongoing. The test should not be forgotten at this time. If IHRA will look into it and we could come back to it when IHRA has reached a solution. Having it in the preamble with a date for review to include it or not and specifying that IHRA will do work, could be a solution.

§ 4.1 – 4.1.1 no comment

§ 4.2 Mr Saul asked if we have enough documentation to agree the test. Mr Césari believes that there is no car tested with a high bumper, at least not in EURO-NCAP. This was confirmed with Mr Kinsky. Mr Césari asked if industry could do some testing on cars with low bumper but do the test with the upper leg to check what the readings are.

Mr Yamagushi presented INF GR / PS / 108 which includes information on the high bumper definition.

Mr Bilkhu suggested to have IHRA defining this. With the simplistic definition as proposed in PS/108 it would mean problems in the US market.

Mr Césari agreed and additionally does not see the need to cover cars which have a load path only below the knee.

Mr Mizuno said that OICA would draft a proposed definition for the high bumper as agreed before.

Mr Kinsky said that the test has not the intention to test standard passenger cars. That's why OICA will make a proposal.

Mr Doyle likes clarification if indeed the group agreed to have the test as it is now and maybe have changes later when IHRA is ready.

Mr Césari concluded that a clear definition is needed and that OICA will supply that. For the cars who fall under this definition, the upper leg to high bumper test is the only possible alternative.

Mr Saul said that the requirements are in §5.1.2. What is the rationale for these numbers?

Mr Doyle said these numbers came out of the EEVC biofidelity work.

Mr Notsu agreed to remove the brackets but need good justification in the preamble. Additionally he requests IHRA to review the test method.

§4.2 – 4.3 Editorial changes agreed.

§5-5.1 no comment

§5.1.1 Mr Doyle clarified that the numbers are related to Phase 1, as the final content of Phase 2 is not known yet. Once the EU feasibility study is finalised, the numbers may need changing.

Mr Césari asked if how much the 10 mm elongation of the ligaments corresponds to the bone displacement.

Mr Ishikawa said this is very difficult to calculate.

Mr Césari clarified that biomechanical work showed that the maximum elongation is more 15 mm than 10 mm.

Mr Ishikawa said the length of a ligament is about 30 mm and 30% elongation is the maximum.

Mr Kim asked what MCL, ACL and PCL is.

Mr Ishikawa explained this stand for median collateral ligament, P is posterial, A is aterial.

Mr Kim said this needs to be clarified in the text.

Mr Mizuno agreed.

Mr Césari said it is difficult to put limits which are specific for a design (the 20 mm elongation relates to the specific leg of the ligament design in the impactor). A more general wording is necessary.

Mr Ishikawa said a biofidelic corridor is available so this discussion is not necessary.

Mr Ries said IHRA decided on 20° and 350 Nm, how this is measured in a tool is irrelevant.

Mr Doyle said another approach is that the impactor to be used needs to be very well specified in the gtr. In that case the text can stand as it is but it should be in square brackets.

Mr Ries said that it is too optimistic to include the FlexPLI in the gtr. He refers to INF GR / PS /100 which gives the option to the manufacturer.

Mr Kim asked why not at the choice of the government.

Mr Kinsky replied that different solutions may be possible depending on the impactor used. So if the government would ask to test with the other leg, you risk failing the test.

Mr Saul remarked that if we don't know if they provide equivalent safety protection the option should maybe not be given in the gtr. More information is needed on this.

Mr Mizuno said one idea is to start with one, then have an overlap period and then shift to the best one.

Mr Kinsky added that the preamble could say a review is needed by a certain data.

Mr Langer explained that when safety belt use became mandatory for Regulation 12 there was the option to use the body block or the adult head on the steering impact.

Mr Notsu said that the door lock gtr offers the option to the government and he would reserve his position on this.

Mr Van der Plas clarified that this relates to a device on the car (the child safety lock) not on a test or a test tool.

Mr Langer added that at the option of the government is no option in this case otherwise two cars will need to be developed: one for EU and one for Japan for example.

Mr Doyle is of the opinion that only one impactor should be in the legislation. It is clear that the ultimate goal is the FlexPLI. We could put it in the preamble and specify a date by when the work should be finalised and be replace the rigid legform.

Mr Césari concluded that in the preamble it will be specified that at a certain time one single impactor will replace the one specified in the gtr.

Mr Mizuno proposed a compromise INF GR / PS / 109: FlexPLI to be the sole impactor for the future but further work is needed. GRSP could institute a monitoring committee that should overview work to be finished by 2007. GRSP to insert the FlexPLI in the gtr and decide on the effective date. Both the rigid and the FlexPLI will exist in parallel for a period of 5 years after which the rigid impactor will disappear. His proposal included a suggestion for the monitoring committee (members and work schedule).

Mr Ries agreed this would be a good wording for the preamble. The first sentence should also deal with useability, repeatability, reproducibility, sensitivity.

Mr Césari concluded that everyone agrees on the principle, the correct wording will be drafted by the secretariat.

This was supported by Mr Doyle.

Mr Mizuno explained that GRSP should organise a monitoring committee to validate the FlexPLI as a tool for the gtr legform test.

Mr Notsu suggested to include Korean participation in the committee. Mr Youn agreed.

Mr Saul asked what the relationship with IHRA is.

Mr Mizuno said IHRA can assist.

Mr Césari said that a GRSP group would give more power to the work and similar groups have existed before.

Mr Kinsky commented that if a round robin test is done in test houses alone, car manufacturers will have no chance to study it and will be able only in 2007 to start development. So a transitional period of 8 years would be better.

Mr Saul said this is not a decision at this point in time. This will have to be decided when more information is available in the monitoring committee.

Mr Doyle agreed that the transitional period has to be decided in GRSP after monitoring committee is finished. A wording like 'appropriate transitional provision' would be best.

Mr Ries asked if §5.1.1 will remain as in PS/100.

Mr Van der Plas stated that the FlexPLI can only be mentioned in the preamble and nothing can be stated in the gtr text on the FlexPLI yet until GRSP decides to include it in the gtr text.

Mr Notsu agrees but suggests attaching the relevant paragraphs for the FlexPLI to the preamble.

Mr Doyle said that would not be possible as it will be seen as the content that will be introduced later and many changes will still happen.

Mr Kinsky added that it will be kept on the record of this group as a working document.

Mr Césari suggest that Japan develops a working document for the FlexPLI and this will be referred to in the preamble.

Mr Kinsky asked if the tests could be done in the four regions around the table in order to avoid that only one will do the work.

Mr Césari concluded that the proposal was agreed: principle as proposed by Mr Mizuno,

Mr Youn asked if we accept that there are different criteria for the rigid legform and for the FlexPLI.

Mr Césari said that a transfer function for the measurements on the FlexPLI may be necessary so that elongation ligament can be translated into a bending angle and something similar for shearing.

Mr Ishikawa said more than 11 years were spend to finalise an ISO standard but this is only for speeds up to 20 km/h. ISO is now working on a high speed draft.

Mr Césari said this is ISO work.

Mr Césari suggested to adapt the wording in line with what was just agreed. This was done.

Note of the Secretariat: as mentioned in the action plan (INF GR / PS / 112) under number 9 following wording could be used to word the compromise reached (the wording is based on the text provided in INF GR / PS / 109):

“As the FlexPLI has high biofidelity and excellent injury assessment ability, the FlexPLI should be adopted as the sole lower legform impactor for the future. However, because of the lack of experience in using the FlexPLI as a certification tool, a further confirmation process is needed. Therefore, WP29 GRSP is requested to set up a Monitoring Committee. This Committee shall, based on independent studies and relevant information provided by its Members, monitor the reliability of the FlexPLI as a certification tool. The Committee shall decide by [dd/mm/2007], whether the FlexPLI can be used for testing and compliance verification purposes. The Committee should also propose the effective date of entry into force and the date at which the FlexPLI will supersede the rigid lower legform impactor. The transitional period during which the FlexPLI and the rigid lower legform impactor can be used as alternative shall be [5] years.”

§5.1.2 Editorial correction

§5.2 no comment

§5.2.1 – 5.2.2 Mr Ries explained the need to refer to the bonnet top otherwise the windscreen could be tested with the child headform. As this paragraph refers to the injury limits and those limits are different for the bonnet top and the windscreen, this paragraph can only refer to the bonnet top. This was agreed with some editorial changes.

Mr Mizuno asked if there is a proposal for the values in relation to the footnote.

Mr Kinsky said the industry proposal was $HIC < 1000$ for 2/3 and < 2000 for 1/3 of the area.

Mr Doyle explained that the feasibility study will bring the outcome for the footnote.

§5.2.3 Mr Ishikawa explained that in the Japanese technical standard there is an exemption zone. Mr Ishikawa agreed to remove the bracket for the paragraph and to put it around the 1000 value.

§6 – 6.1 no comment

§6.1.1 Keep the brackets on request of the EU

§6.1.1.1 – 6.3 no comment

§6.3.1 The footnote was deleted.

§6.3.1.1 – 6.3.1.1.9 Agreed to not mention anything on the FlexPLI.

§6.3.1.1.7.5 Mr Kim said the ISO reference should be 2002, not 2000.

§6.3.1.2 the brackets can be deleted

§6.3.1.2.1 – 6.3.1.2.6 Mr Césari commented as currently we only use the impactor for the high bumper test, these paragraphs should be simpler. Mr Césari commented that everything until §6.3.1.2.6 should be checked. This will be done by OICA before next meeting.

§6.3.1.2.7 – 6.3.1.2.7.2 no comment

§6.3.1.2.7.3 Mr Kim said the ISO reference should be 2002, not 2000.

§6.3.1.2.8 - 6.3.2 no comment

§6.3.2.1 the brackets can be deleted except for [5] mm and the skin thickness to be $14 \pm 0,5$ mm. The note to be kept as it is related to the accelerometer position. The figures 16 and 17 will need to be corrected as well.

§6.3.2.1.2 [30] mm in line with the earlier discussion and the other brackets to be removed. The note was deleted and the subsequent text was revised to include what the orientation is in case of a three-uniaxial accelerometer. The last paragraph should be kept.

(Note of the Secretariat: §6.3.2.1.2 renumber to 6.3.2.1.3)

§6.3.2.1.3 renumber to 6.3.2.1.4)

§6.3.2.2 brackets removed around diameter, all other brackets are kept except for the skin thickness $14 \pm 0,5$ mm

§6.3.2.2.1 [30] mm in line with the earlier discussion and the other brackets to be removed. The note was deleted and the subsequent text was revised to include what the orientation is in case of a three-uniaxial accelerometer. The last paragraph should be kept.

§6.3.2.2.2 – 7.1.1.1.1 no comment

§7.1.1.2 Mr Ries explained that the tolerances result in too big scatter. This is also addressed in the EU feasibility study. The brackets will be kept.

§7.1.1.3 The 25 mm above the ground clearance is introduced. Figure 19 is corrected accordingly.

§7.1.1.3.1 Mr Ries explained that the tolerances result in too big scatter. This is also addressed in the EU feasibility study. The brackets will be kept.

§7.1.1.3.2 – 7.1.1.3.3 no comment

§7.1.1.4 comment was deleted

§7.1.2 remove bracket

§7.1.2.1 The first sentence will be put in brackets until a definition on the high bumper is agreed and there is no agreement yet on which legform can be used as the EU feasibility study is proposing to delete the option and make the upper leg mandatory. Mr Saul asked what the differences are in the performance requirements when either the upper leg or the lower leg is used. Mr Césari explained it are the requirements attached to each impactor and not one set of requirements for this area. Mr Saul said this should not be a manufacturer option as it will be difficult to justify.

Mr Césari concluded that it is not acceptable in a gtr to have the selection of the impactor as an option.

§7.1.2.1.1 no comment

§7.1.2.2 Mr Ries explained that the tolerances result in too big scatter. This is also addressed in the EU feasibility study. The brackets will be kept.

§7.1.2.2.1 – 7.1.2.3 no comment

§7.2 editorial correction

§7.2.1 no comment

§7.2.2 Mr Ries explained this must be completely updated but there is no agreement yet on a possible exemption zone for relaxed requirements. So keep the brackets. Mr Doyle added that for small bonnets it may be problematic to have 18 tests whilst maintaining the minimum required distance between the test points.

§7.2.3 Mr Ries explained the OICA amendments including specifications for tests on the windscreen. This was accepted but the brackets around the number of windscreen tests are kept.

§7.2.3.1 – 7.2.4 no comment

§7.2.5 brackets are kept for the time being

§7.2.6 – 7.2.6.1 no comment

§7.2.6.2 The tolerances remain in brackets, the other brackets are removed except for the bracket from 7.2.6.2 to 7.2.6.3.2 which are kept. Mr Saul said the feasibility study questioned some angles. Mr Césari confirms this but this group is using the results of IHRA.

Mr Doyle asked to include ‘at the point of impact’ after the 30°.

Mr Van der Plas clarified this would result in a car being a 1-box and a sedan at the same time depending on the point of impact on the bonnet.

Mr Langer explained that the Japanese technical standard gives one angle which divides the vehicle into a category: 1-box or sedan / SUV.

Mr Doyle suggested a new wording for §3.3 definition of the bonnet angle to reflect this.

Mr Ries objects as this makes it more complicated as the same car will be in two different categories depending on the bonnet angle.

Mr Césari suggests to change the definition in §3.3 according to the EU proposal and put it in square brackets and additionally in §7.2.6.2 and 7.2.6.3 add ‘[at the point of impact]’ behind 30°.

Mr Kinsky underlined this will be an enormous burden for the industry.

Mr Césari explained that in order to be consistent the same should be done than for the bonnet leading edge height.

Mr Doyle clarified that no reference should be made to vehicle categories as the gtr does not specify this. The test conditions should change with the change in shape (angle, ...).

Mr Kinsky said that this comes from IHRA and what is created now is something completely new.

Mr Ries proposes to keep the text as it is.

Mr Langer explained that the head angle is defined at first contact with the pedestrian and is irrelevant to the bonnet angle.

Mr Césari summarises the options: 1. keep text as it is (IHRA / Japanese approach); 2. change to the new proposal to have different test angles depending on the impact point; 3. use one value as in the EU Directive

Mr Ishikawa said that for test houses the second proposal is too difficult.

Mr Notsu supported this.

Mr Youn said that FMVSS201 is even more complicated and everyone does the testing. But they have no preference for the options now.

Mr Saul has no strong preference either.

Mr Luckaszewics stated that the OICA comments were reasonable as the head angle is defined at first contact with the pedestrian and is irrelevant to the bonnet angle.

Mr Césari suggests keeping the text as it is between brackets and OICA to check if there are many cars which change from one test condition to another depending on the impact point.

§7.2.6.3 no comment

§7.2.6.3.1 The tolerances remain in brackets the other brackets are removed.

§7.2.6.3.2 The tolerances remain in brackets the other brackets are removed.

§7.2.6.4 no comment

§7.3 The complete paragraph (up to 7.3.6.4) will be aligned with the decisions on the child headform test procedure

§8 to be completed by next meeting for the impactors which have been decided

8. First official draft gtr to GRSP/36 in December 2004

Mr Mizuno explained the timing for the gtr: for next GRSP (December 2004), the first official draft gtr should be presented to GRSP to serve as basis for comments from all Contracting Parties and industry. This should result in an official draft gtr to the May 2005 GRSP for final adoption at AC3 in November 2005. He asked for everyone’s assistance to do all necessary work for next meeting so that most if not all brackets can be removed next meeting.

9. Action items necessary to complete prior to next meeting

Mr Van der Plas went through INF GR / PS / 112 summing up the actions from this meeting.

10. Next meeting

16-18 February 2005, in Europe. Mr Van der Plas will check the exact meeting place.

11. A.O.B.

Mr Mizuno closed the meeting thanking all attendees for their constructive work.

Mr Césari underlined that next meeting will be the last before the meeting will be finalised so constructive proposals and work is necessary.

List of new documents:

INF GR / PS / 101	JAMA feasibility study Phase 2
INF GR / PS / 102	OICA windscreen testing according to EURO-NCAP protocol
INF GR / PS / 103	CLEPA windscreen testing on one car model
INF GR / PS / 104	Draft CLEPA / OICA document on active bonnet testing
INF GR / PS / 105	Lower leg research for developing corridors
INF GR / PS / 106	J-MLIT proposal for FlexPLI answering item 9 of PS/83
INF GR / PS / 107	Ligament drawing
INF GR / PS / 108	JAMA information on high bumper definition
INF GR / PS / 109	Chairman proposal for FlexPLI and rigid impactor use in gtr
INF GR / PS / 110	OICA proposal for side and rear windscreen reference line
INF GR / PS / 111	Guideline for preamble
INF GR / PS / 112	Action plan
INF GR / PS / 113	Revision of draft gtr
INF GR / PS / 114	Attendance list
INF GR / PS / 115	Draft meeting minutes of the 7 th meeting
INF GR / PS / 116	Cleaned up version of draft gtr