

# **MINUTES OF THE FIFTH MEETING OF THE GRSP INFORMAL GROUP ON A POLE SIDE IMPACT GTR**

Held at the UK Department for Transport  
Great Minster House, 33 Horseferry Road, London  
22-23 March 2012

## **Attendees**

<b>Name</b>	<b>Organization</b>
Robert Hogan (Chair)	Department of Infrastructure and Transport (Australia)
Thomas Belcher (Secretary)	Department of Infrastructure and Transport (Australia)
Mark Terrell	Department of Infrastructure and Transport (Australia)
Anthony Jaz	Transport Canada
Richard Damm	German Federal Ministry of Transport
Mary Versailles	NHTSA, US Department of Transportation
Stephen Ridella	NHTSA, US Department of Transportation
Hans Ammerlaan	RDW
Peter Broertjes	European Commission
Bernie Frost	United Kingdom - Department for Transport
Jim Hand	United Kingdom - Department for Transport
Jean-Phillipe Lepretre	UTAC France
Yoshinori Tanaka	NTSEL - Japan
Daisuke Yamaguchi	NTSEL - Japan
Akito Sakai	JASIC
Thomas Löw	Audi
Philipp Wernicke	BMW Group
Ansgar Pott	OICA / Hyundai Motor Europe Technical Center
Christian Wegeleben	Daimler
Andre Haas	Daimler
Myriam Constant	PSA Peugeot Citroen
Irina Dausse	Renault
Peter Davis	SMMT
Karsten Hallbauer	Takata
Bhavik Shah	Jaguar Land Rover (JLR)
Takehisa Yamakawa	JAMA
James Abraham	Ford Motor Company
Akihiko Akiyama	Honda
Jinhwa Song	KATRI
Siwoo Kim	KATRI
Michael Fitzharris	Monash University Accident Research Centre (MUARC)
Claus Pastor	BASf

## **1. Welcome and Introductions**

(Attendees as noted above)

Mr Hogan thanked the UK, particularly Mr Frost, for hosting this meeting as well as other GRSP informal group meetings in London during the week.

## **2. Adoption of the Agenda**

The agenda circulated by the chairman immediately prior to the meeting was amended by removing the French crash test and US category 2 vehicle presentations from the agenda. The agenda was then adopted (see [PSI-05-01](#)).

ACTION: France to make a presentation on its crash program at the 6<sup>th</sup> meeting in June.

## **3. Minutes of the Fourth Meeting and Progress Report to WP29**

The minutes ([PSI-05-02](#)) from the fourth meeting held in Seoul, South Korea and circulated by the chairman prior to the meeting were agreed without amendment.

Mr Hogan advised that Australia had submitted an informal document ([GRSP-50-20](#)) to the 50<sup>th</sup> session of GRSP (December 2011) incorporating the second progress report of the informal group and a proposed change to the terms of reference to allow a pole side impact GTR to be developed in two phases. During the first phase, the informal group would draft pole side impact requirements for a WorldSID 50<sup>th</sup> percentile adult male. In the second phase, the informal group would draft pole side impact requirements for a WorldSID 5<sup>th</sup> percentile adult female. Mr Hogan advised that GRSP had agreed to the proposed changes to the informal group terms of reference in December 2011 and that in-principal agreement had also been received from AC3 in March 2012 (during the week preceding the PSI GTR informal group meeting). Formal agreement of AC3 to this proposed change in the terms of reference would be sought in June 2012.

## **4. Actions of 4<sup>th</sup> Meeting**

Mr Hogan summarized the action list from the 4<sup>th</sup> meeting of the PSI GTR informal group, noting the work that had been done with respect to each action item.

## **5. MUARC Analysis of Australian and UK Side Impact Data**

Dr Fitzharris presented MUARC's analysis of in-depth (CCIS) and mass crash data (Australian Fatal Road Crash Database, UK Stats 19, Victorian Transport Accident Commission) commissioned for the development of the pole side impact GTR by Australia ([PSI-05-03](#)).

Among other things, the CCIS analysis showed a significantly higher risk of serious injury and death in pole side impact crashes compared to vehicle-to-vehicle side impacts and an increased probability of abdominal and pelvis injuries for female occupants. The AIS 2+ shoulder injury risk odds ratio for pole side impacts relative to vehicle-to-vehicle

side impacts was 7.89.

The Australian Fatal Road Crash Database analysis of coroner's cause of death rulings showed that head injuries were the leading coroner ruled cause of death for both fatal pole and vehicle-to-vehicle side impact crashes.

Significantly, the cost of injury analysis indicated that non-fatal severe (AIS 4+) head injuries were costing an average of \$AU4.8 million and non-fatal serious (AIS 3) head injuries were costing \$AU3.7 million (i.e. there are very high lifetime care costs associated with non-fatal serious/severe/critical head injuries).

The initial MUARC benefit cost ratio (BCR) modelling across a variable incremental cost range indicated that the introduction of a GTR for PSI in Australia would be cost-effective, with a break-even incremental cost of \$AU160 per vehicle (for pole side impacts alone). At this incremental cost the overall BCR estimate was around 3, as benefits of a pole side impact GTR are not just limited to pole side impact crashes.

Mr Hogan asked members of the informal group to provide written comments and feedback on this MUARC analysis to Australia over the next couple of weeks, so that any feedback could be taken into account for the preparation of the final MUARC report.

ACTION: Members to provide comments on MUARC presentation.

Mr Hogan summarized that although the analysis was largely based on Australian/Victorian analysis there were a number of important findings that were likely to apply elsewhere. The standout findings were the high cost of head injuries and the high incidence of fatal head injuries in vehicle-to-vehicle side impact crashes in Australia. Significant benefits would therefore be likely to accrue elsewhere in the world, even in countries that have relatively lower pole side impact crash rates than Australia.

## **6. BAST Analysis of German Side Impact Data**

Dr Pastor presented a BAST analysis ([PSI-05-04](#)) of the pole side impact accidents in the German In-Depth Accident Study (GIDAS). Data was largely consistent with the MUARC analysis of Australian pole side impacts, but in contrast to the MUARC analysis the GIDAS data did not show an increased pole side impact involvement for younger drivers.

## **7. Crash Tests**

### 7.1. Joint Australian/Canadian Crash Test Program

Mr Belcher presented an updated summary of the joint Australian and Canadian pole side impact crash test research ([PSI-05-05](#)). It was noted that many of the vehicles tested would have failed a 50% AIS 2+ shoulder injury risk limit, that there was consistently more forward movement of the ribs in the perpendicular pole tests with oblique pole tests producing a more lateral rib deflection response, and that in a majority of cases the injury response values for each vehicle model were higher in the 32 km/h oblique test than the 29 km/h perpendicular test. It was also noted that late deployment of a thorax side airbag

can push the ribs forward considerably without significant IRTRACC deflection. Mr Belcher suggested that in such cases a reasonably generous 3ms lower spine acceleration limit value may be able to prevent a situation where a very late thorax airbag deployment may actually otherwise help a vehicle pass a maximum thorax or abdomen rib IRTRACC deflection limit value.

## 7.2. Japanese Kei-car Program

Mr Tanaka presented the Japanese pole side impact research and proposal for Kei-cars ([PSI-05-06](#)). In Japan, there is a light motor vehicle category (known as Kei-cars), which includes passenger vehicles with a width less than or equal to 1480 mm.

Mr Tanaka stated that approximately 30% of passenger cars in Japan are Kei-cars and Kei-cars are very suitable for small parking spaces, narrow roads and densely populated areas in Japan. The Kei-car is therefore very important to Japan. Japan believes that it may be very difficult for Kei-cars to comply with a 32 km/h vehicle-to-pole side impact GTR, especially given the limited space available between the dummy thorax and the side door.

Japan had conducted a 75 degree oblique vehicle-to-pole side impact test using a Kei-car model available in Japan at 32 km/h and 26 km/h. The vehicle model tested is unlikely to meet pole side impact GTR thorax rib deflection criteria limit values at 32 km/h, but could meet a 26 km/h vehicle-to-pole side impact test.

Mr Tanaka then presented data indicating pole side impact speeds for Kei-cars are five to seven km/h slower than other vehicles in Japan. Because of this Japan would like a 26 km/h test speed to be included in the GTR for vehicles less than 1500mm wide.

Mr Ammerlaan noted that there may be an opportunity for significant benefits to be achieved by including these vehicles in the GTR, given they account for 30% of the passenger vehicle fleet in Japan.

Mr Hogan stated that contracting parties could well take the view that exemptions related to Kei-cars, or similar vehicles, are a national issue to be dealt with in national legislation. However, he noted that Australia's preference was for Kei-cars to be specifically addressed in the GTR and that Japan's request to include Kei-cars was a very positive initiative.

It was then agreed that possible Kei-car exemptions would be discussed as part of broader discussions on exemptions at agenda item 11.1.

## **8. Safety Need**

### 8.1. Update of Country Safety Need Data

Mr Hogan presented an updated spreadsheet with high level safety need data ([PSI-05-08](#)), including data provided since the last meeting from France, Germany and the Netherlands. Mr Hogan thanked those countries for providing data and undertook to update this high level safety need summary data further by incorporating data provided by Canada for 2009 and the UK for 2010. Mr Hogan noted that there were gaps in the

Australian data, but that the ongoing MUARC analysis is likely to address this.

ACTION: Australia to update high level safety data spreadsheet and re-circulate to members.

## **9. WorldSID Update**

Ms Versailles summarized the progress of the Informal Group on the Harmonization of Side Impact Dummies (WorldSID Group), including the outcomes and major remaining issues from the WorldSID meeting held the previous day in London (21 March 2012).

Humanetics ATD had provided an update of proposed design changes for the WorldSID 50<sup>th</sup> male dummy, including material changes required as a result of environmental regulations which will restrict the availability of materials currently used for the dummy pelvis bone, pelvic flesh and head skin. Humanetics ATD had identified some potential replacement materials, with refinements and investigations of the suitability of the likely candidate materials to be undertaken in coming months.

Ms Versailles advised that an additional ISO meeting had been scheduled for April, to finalise a WorldSID 50<sup>th</sup> male seating procedure for consideration of the WorldSID group, and resolve any other outstanding issues quickly. This could enable the WorldSID 50<sup>th</sup> design to then be frozen for regulation.

Ms Versailles noted that although there are currently only one dimensional thorax injury risk curves available for the WorldSID 50<sup>th</sup> male dummy, the WorldSID group was considering 2D-IRTRACCs for the dummy. This would enable the WorldSID 50<sup>th</sup> dummy to be used with injury criteria limit values based on currently available one dimensional thorax injury risk curves in the short term, as well as allow for likely future developments.

Ms Versailles noted that the other major remaining issue was the drawing package and manuals and that consultation with Humanetics and ISO would be required.

Mr Hogan stated that Australia was planning to submit a draft regulatory text of the pole side impact GTR to the May 2012 session of GRSP. Australia would like to be able to achieve final agreement by Working Party 29 in June 2013.

## **10. Benefit Cost Analysis**

### 10.1. Industry Cost Data

Mr Pott presented a summary of pole side impact protection cost data based on studies of EEVC and NHTSA ([PSI-05-07](#)). Mr Pott explained that the EEVC data covers M1 vehicles for the European market subject to the UN R95 test and the GTR would also cover emerging countries where there is currently no side impact regulation. Mr Pott noted that provision of more specific cost data was constrained as there were concerns within OICA about companies being able to compare each other's internal costs and concerns about cost comparisons being viewed as a breach of anti-trust legislation in some countries.

Mr Hogan was concerned that the figures provided are not in the incremental form that is needed for the GTR. Mr Hogan also asked if the costs have come down since the EEVC and NHSTA studies had been done.

Mr Pott stated that the costs would vary by manufacturer and depending on where vehicles/components are manufactured, but that there is also inflation, airbags may need to be larger and there are development and homologation costs.

Mr Hogan undertook that Australia would further analyse the information on costs presented by OICA.

Mr Ammerlaan advised that the report containing the EEVC costs was not publicly available on the internet.

ACTION: UK to provide a copy of the EEVC WG13 (Side Impact Protection) report including cost data for pole side impact protection to informal group members (CLOSED).

ACTION: Australia to consider OICA cost presentation and consult further with OICA.

## **11.GTR Issues**

### 11.1. Possible Exemptions

Mr Pott presented an OICA proposed revision to the scope of the GTR ([PSI-05-09](#)). The purpose of the proposed revision was to exempt small buses (Category 1-2), vans (Category 2) and mini-trucks (Category 2) from the scope of the GTR. Interior Volume Index (IVI) and the distance of the R-point from the transverse centreline of the front axle were proposed as a means of distinguishing vans and mini-trucks from other Category 2 vehicles. This would allow these vehicles to be exempted without having to exempt other Category 2 vehicles more represented in accident statistics in some regions (e.g. utes and pick-up trucks).

Mr Jaz's preference was for exemptions to be dealt with in national legislation.

Mr Pott was concerned that some of the vehicles proposed for exemption (e.g. mini-trucks) may be exempted in some regions and others not. This would not be harmonization. Mr Pott noted that Category 2 vehicles that were relatively highly represented in accident statistics in Australia and the US (e.g. utes and pick-ups) would not be exempted from the GTR under the OICA proposal.

Mr Ammerlaan supported the inclusion of Category 2 vehicles in the scope of the GTR on the basis that some Contracting Parties may have a national safety need. If exemptions then vary by country there will still be harmonization as there is harmonization of the test procedure.

Ms Versailles stated that some of the proposed exemptions are country specific exemptions and stated a preference for exemptions to be dealt with at the time of implementing the GTR in national legislation. She noted that exemptions in GTR 9 had been provided for design reasons that were not clearly apparent in this case.

Mr Frost suggested that this may be best handled by including text in the preamble outlining the steps governments may follow to alter the scope when considering exemptions in the implementation of national legislation. It would be difficult for some Contracting Parties to agree to a GTR that limits their ability to address national safety issues.

Mr Damm suggested that the inclusion of the OICA proposed exemptions in the scope of the GTR might make global acceptance of the GTR difficult. This does not mean a pole side impact regulation would be applied to heavy goods vehicles in Europe. Perhaps a footnote or other appropriate text could be used in the GTR instead. Mr Damm also put emphasis on the need for exemptions to be supported by a technical basis.

Mr Broertjes was open to the possibility of exemptions for some vehicles (e.g. mini-trucks) even if the current OICA proposal was not able to be accepted. Mr Broertjes felt there was definitely merit in excluding some vehicles.

Mr Hogan noted that the general view of Contracting Parties around the table was that exemptions would need to be dealt with in the implementation of national legislation. Australia believed Category 2 vehicles should be included in the scope of the GTR. Australia's preference was for Kei-cars to be explicitly covered in the GTR rather than leaving Japan to deal with this in national legislation.

Mr Pott suggested Category 2 vehicles could perhaps be excluded from the GTR as pole side impact requirements for Category 2 vehicles could be considered as an extension to cover some markets (e.g. Australia and the US). OICA was concerned some countries, including countries not involved in the informal group would end up simply applying the GTR to vans because the scope includes them. It also needs to be checked that the test procedure is feasible, including with a WorldSID dummy in vehicles with uprights seats, for Category 2 vehicles.

Ms Versailles was concerned that an extension of the scope of the GTR in national legislation may not be possible under the terms of the 1998 Agreement and could also be argued to be a technical barrier to trade.

Mr Terrell noted that there are some Category 2 vehicles for which there would be benefits and Australia did not want these exempted from the GTR.

Mr Broertjes view was that if a vehicle type is not included in the scope of a GTR then such vehicles are not covered by the GTR and a Contracting Party can therefore implement their own unique requirements for such vehicles in national legislation. Mr Broertjes supported the inclusion of a specific exemption/relaxation for Kei-cars as this would help to facilitate a harmonized approach to Kei-car issues. Including vehicles in the scope of a GTR provides a basis for the harmonization of requirements for these vehicles.

Mr Hogan agreed that Kei-car type vehicles should be specifically addressed in the GTR, as there was otherwise a risk a variety of different exemption/relaxation approaches would develop.

Mr Ammerlaan and Mr Frost noted that the 1998 Agreement allows where appropriate for alternative levels of stringency to be applied for different markets (e.g. Article 4, paragraph 4.2 of the 1998 Agreement). This approach may need to be followed for Kei-cars.

Mr Frost suggested it would also be important to better understand (i.e. carefully define) exactly what a Kei-car is, as they might be M category vehicles in some markets and L category vehicles (i.e. heavy quadricycles) in others.

Japan indicated that it would like Kei-cars to be specifically considered in the GTR. It cannot be guaranteed that Kei-cars could actually meet a 32 km/h pole side impact GTR requirement and Kei-car manufacturers do not currently have a WorldSID so it will also be difficult to develop these vehicles to this extent.

Mr Hogan summarized that there was a general preference among contracting parties to handle exemptions in their own domestic legislation, but that further discussions may be necessary to avoid unnecessary divergence of exemption provisions.

Mr Damm stated that there were two options for the Kei-car. One is to exclude the Kei-car from the GTR. The second option is to have some requirements for Kei-cars in the GTR. Under this option (the better approach) the question would be whether to handle this in the scope or in another part of the GTR. Mr Hogan suggested test speed as an option in this regard.

It was agreed to consider Kei-cars further under consideration of the GTR regulatory text (Agenda item 12).

### 11.2. Impact Reference Line Tolerance

Mr Belcher made a presentation on the importance of pole side impact test alignment when using a WorldSID 50<sup>th</sup> dummy ([PSI-05-10](#)). Australia have previously conducted perpendicular vehicle-to-pole side impact tests on the same vehicle model with the pole aligned directly with the WorldSID 50<sup>th</sup> head centre of gravity and 100mm forward of the WorldSID 50<sup>th</sup> head centre of gravity. This had shown that changing the pole impact alignment by 100mm can make as much difference to the WorldSID 50<sup>th</sup> peak rib deflection responses as changing the angle of impact by 15 degrees. Both FMVSS 214 and the EuroNCAP pole side impact protocol include a  $\pm 38$ mm impact alignment tolerance (76 mm wide allowable impact zone). Analysis of actual impact alignments in Australian and Canadian pole side impact research tests, ANCAP pole tests and US NCAP pole tests indicated that it is feasible to consistently produce an actual impact alignment within 15mm of the target impact alignment. To ensure type approvals are issued based on tests of comparable stringency it would be desirable to specify a  $\pm 20$  mm impact alignment tolerance in the GTR.

Mr Pott advised that the OICA comments on the draft GTR had suggested a  $\pm 25$  mm impact alignment tolerance, because this should be feasible using a variety of different vehicle-to-pole side impact test methods.

There was broad agreement to a  $\pm 25$  mm impact alignment tolerance. Ms Versailles did not see any immediate issue with specifying a tighter impact alignment tolerance, but



indicated that she would need to have internal discussions before agreeing to this reduced impact alignment tolerance. It was agreed that a  $\pm 25$  mm impact alignment tolerance would be included in the updated draft GTR regulatory text, with Ms Versailles to have discussions within NHTSA.

**ACTION:** NHTSA to review proposal for  $\pm 25$ mm impact alignment tolerance and advise if acceptable.

### 11.3. Commencement Timing

Mr Hogan sought member's views on suitable commencement timing of a pole side impact GTR.

OICA indicated that the most important thing was not to introduce the standard too quickly, and that appropriate lead time for required design changes should be provided.

Ms Versailles stated that it was difficult for every country to implement the GTR at the same time, as each country could be at different stages in the safety development of their vehicle fleet.

Mr Frost suggested that some text should be included in the pre-amble recognising the challenges (i.e. time) required to make changes to vehicles to comply with the GTR, but that it may stretch the bounds of the 1998 Agreement to specify dates.

Mr Abraham suggested that it may be appropriate to use similar commencement timing text as was included in GTR 9.

## **12. Consideration of Draft GTR**

Ms Versailles advised that NHTSA would need to carefully review the purpose wording currently included in the draft regulatory text and may propose revisions if necessary.

**ACTION:** NHTSA to review purpose wording (paragraph 1) in draft regulatory text and suggest revised wording if necessary.

Mr Hogan advised that on the basis of discussions held on possible exemptions (agenda item 11.1), Australia would leave any possible exemptions out of the draft GTR regulatory text to be submitted to GRSP in May, although the Informal Group would continue discussion at its next meeting.

**ACTION:** NHTSA to consider proposed use of Special Resolution 1 unladen mass definition for the purpose of defining the test vehicle mass, test vehicle attitude, fuel ballast etc throughout GTR regulatory text.

Ms Versailles advised that the WorldSID group currently had injury risk curves available, but that NHTSA may not be in a position to agree injury risk values without delaying the timeline of the GTR. Given benefits-cost may vary depending on where different countries are with their fleet, she suggested that perhaps the GTR could include injury risk curves, with Contracting Parties to choose appropriate limit values when implementing the GTR in national legislation.

Mr Löw and Mr Pott were concerned that this provided too much freedom which could result in considerable variation and disharmonization.

Mr Lepretre stated a preference for one set of threshold values. He indicated that if optional threshold limit values were to be included it would be equally valid to have other options in the GTR, for example an option for 90 degree impact.

Mr Wernicke noted that 50% AIS 3+ injury risk threshold values are used for the FMVSS 214 pole test.

The issue of setting more demanding threshold values also arose and Mr Pott suggested that the group focus on harmonizing the requirements rather than increasing stringency as well. Mr Pott suggested that NCAP programs could be used to encourage better performance in some markets.

Mr Ridella and Mr Belcher noted that pole side impact crash test research presented at this meeting and previous meetings of both the pole side impact GTR and WorldSID informal groups had shown that there are countermeasures available that can ensure much lower injury risk than 50% AIS 3+.

Mr Ridella stated that it was important to be able to achieve improvements and that NHTSA did not want to be locked in to continuing to apply current 50% AIS 3+ injury risk threshold values in the future.

Mr Frost noted that the GTR should not simply regulate the status quo or set the limits that had been applied in the past. The purpose of regulating is to achieve a benefit. Mr Frost suggested that Australia and the US should investigate how reducing the AIS 3+ injury threshold values may influence the benefits that may be obtained under the GTR.

ACTION: Australia/NHTSA to investigate incremental benefits that may be obtained by lowering the AIS 3+ injury risk used to set the thorax rib deflection limit in the GTR.

Mr Hogan noted that the inclusion of a shoulder criterion might satisfy some concerns raised about the possibility that excessive loading of the WorldSID 50<sup>th</sup> shoulder could be used to offload the thorax.

Mr Wernicke advised that Medical College of Wisconsin was likely to have further research completed on shoulder forces and shoulder injury risk for the June WorldSID group meeting.

There was some support to include a shoulder performance criterion to prevent excessive loading of the shoulder. However, it was noted that heavy loading of the shoulder may be biofidelic and there was also reluctance in the group to include shoulder performance criteria that may give shoulder injury risk reduction a higher priority than higher priority body regions such as the head and thorax.

Mr Ridella advised that the ISO injury risk curve group had not been able to establish reliable thorax injury risk curves for Viscous Criterion (VC).

Mr Ammerlaan stated that he would prefer the VC to be retained. Mr Ammerlaan was concerned vehicles that produce VC values which are clearly too high might be able to pass the GTR if VC was not included.

Mr Terrell noted that small variations in tests/vehicles can sometimes lead to relatively wide variations in VC results. The differentiation of the rib deflection responses required to calculate VC can exacerbate this VC test result variability. It may therefore be problematic to include a relatively variable criterion also based on unreliable injury risk curves. However there may be a generous/conservative VC limit value that a vehicle should not exceed. Mr Terrell suggested that perhaps a VC limit value could be included on this basis.

ACTION: NHTSA to investigate possibilities for improvement in the robustness of the VC injury risk curves through use of additional research data.

ACTION: NHTSA to advise group of outcome of further work to determine if there are any reasons for the retention of a 3ms pelvis acceleration criteria requirement in the GTR.

Mr Ridella requested that a Brain Injury Criterion (BRIC) limit of 1 be included in the GTR. A requirement for the BRIC not to exceed 1 was included in the draft regulatory text in brackets.

Ms Versailles advised that FMVSS 214 will require vehicles to meet the pole side impact requirements at any speed up to and including 32 km/h. Injuries were occurring in pole side impact crashes at low impact speeds and the US was concerned airbag deployment could be optimised for a single test speed.

Mr Pott was concerned any requirement for vehicles to meet a pole side impact GTR at any test speed up to and including 32 km/h could mean vehicle manufacturers would be required to do many different tests at different speeds in type approval markets.

Mr Pott and Mr Abraham noted that vehicle manufacturers can use appropriate tools including simulation models to satisfy themselves they comply with self-certification regulatory requirements.

Mr Hogan proposed that the GTR be drafted to allow Contracting Parties to require Kei-cars to meet either a 26 km/h test or a 32 km/h test, with a sunset clause to consider the ongoing appropriateness of the 26 km/h option.

Mr Frost noted that there are clauses in the 1998 Agreement that allow for variable stringency and allow Contracting Parties to use national standards where necessary.

Ms Versailles suggested that a similar approach could be used for Kei-cars in the GTR as was used by the US for convertibles in FMVSS 214. Ms Versailles agreed to draft some appropriate text for the next meeting.

ACTION: NHTSA to propose wording that would allow alternative levels of stringency to be applied (e.g. option of 26 km/h test or 32 km/h test with sunset clause) for Kei cars as specifically provided for in Article 4, paragraph 4.2 of the 1998 Agreement.

Ms Versailles advised that requirements for the doors to be unlocked after the test were not included in FMVSS 214 as the US had primarily been concerned with keeping the occupants in the vehicle during the impact, rather than evacuating occupants from the vehicle after the impact.

It was noted that discussions are ongoing regarding the need to amend UN R95 door locking requirements to account for automatically activated door locking systems, but these were not yet resolved and appropriate clauses were unable to be proposed for a pole side impact GTR.

It was decided that requirements for the doors to be unlocked after the impact would not be included in the updated draft of the GTR. Requirements could be considered if/when a workable proposal and supporting safety need justification was able to be made.

ACTION: NHTSA to advise why the transmissions of manual and automatic vehicles are required to be placed in different gears (i.e. second vs. neutral gear) in FMVSS 214. Discussions were held on the fuel ballast specifications to be included in the pole side impact GTR. The most likely options were Stoddard Solvent (as per FMVSS 214) or water (as per UN R95). It was noted that Stoddard Solvent properties (i.e. density, viscosity) may be more suitable for the purpose of simulating the fuel leakage that would occur in most vehicles. It was also noted that it may be necessary to check that Stoddard Solvent is not a commercial name. Further discussions will need to be held to agree fuel ballast specifications. The fuel ballast requirements will need to be considered in conjunction with the fuel leakage requirements.

ACTION: Australia to revise draft regulatory text to allow non-fuel system fluids to simply be replaced by equivalent ballast mass, similar to the equivalent paragraph in UN R95 (SEE DRAFT GTR submitted as an informal document to GRSP - [GRSP-51-16](#)).

It was noted that the informal group working on the development of a GTR for electric vehicles may be able to propose electrical vehicle safety requirements for a pole side impact GTR. It was decided to leave electrical vehicle safety requirements out of the draft regulatory text for the pole side impact GTR for now, pending a possible future proposal from appropriate experts.

ACTION: Australia to draft appropriate vehicle test attitude clauses into the GTR regulatory text based on vehicle test attitude requirements of FMVSS 214. ((SEE DRAFT GTR submitted as an informal document to GRSP - [GRSP-51-16](#), ANNEX 1 PARA 3.5-10).

Mr Frost suggested “ignition” may not quite be the correct term for clause 4.7 of Annex 1 of the draft regulatory text. Mr Frost agreed that the UK could suggest an improved wording for the next meeting.

ACTION: UK to suggest improved wording for the ignition paragraph of the vehicle passenger compartment adjustment section of Annex 1, to better account for compression ignition and electric vehicles (SEE DRAFT GTR submitted as an informal document to GRSP - [GRSP-51-16](#), ANNEX 1 PARA 6.2-3 AND ANNEX 5).

To minimise the possibility for confusion, Mr Frost and Mr Terrell suggested that it

would be better to specify one  $75^{\circ} \pm 3^{\circ}$  angle for both left and right side impact tests, instead of the  $75^{\circ} \pm 3^{\circ}$  for left side impacts and  $285^{\circ} \pm 3^{\circ}$  for right side impacts.

ACTION: Australia to draft simplified wording for paragraph 6.2 of the GTR regulatory text (to improve clarity and reduce opportunity for confusion) in which the angle of impact is defined in terms of one  $75^{\circ} \pm 3^{\circ}$  angle for both left and right side impact tests (SEE DRAFT GTR submitted as an informal document to GRSP - [GRSP-51-16](#), ANNEX 1 PARA 6.2-3 AND ANNEX 5).

### **13.Future Work and Timetable**

Discussions were reserved for future meetings (included as a standing item on the agenda).

### **14.Other Business**

No other business was discussed at this meeting.

### **15.Next Meetings**

Mr Hogan undertook to provide advice on the details of the next meeting expected to be held sometime during the week before WP29 in Munich.

## SUMMARY OF ACTIONS

1. Members to provide comments on MUARC presentation.
2. France to make a presentation on its crash program at the 6 <sup>th</sup> meeting in June.
3. Australia to update high level safety data spreadsheet and re-circulate to members.
4. US and Australia to make presentations on Category 2 vehicles at the 6 <sup>th</sup> meeting in June.
5. UK to provide a copy of the EEVC WG13 (Side Impact Protection) report including cost data for pole side impact protection to informal group members (CLOSED).
6. Australia to consider OICA cost presentation and consult further with OICA.
7. NHTSA to review proposal for $\pm 25\text{mm}$ impact alignment tolerance and advise if acceptable.
8. NHTSA to review purpose wording (paragraph 1) in draft regulatory text and suggest revised wording if necessary.
9. NHTSA to consider proposed use of Special Resolution 1 unladen mass definition for the purpose of defining the test vehicle mass, test vehicle attitude, fuel ballast etc throughout GTR regulatory text.
10. Following meeting, Australia to circulate updated GTR draft regulatory text to informal group members and then submit as informal document to May 2012 session of GRSP.
11. Australia/NHTSA to investigate incremental benefits that may be obtained by lowering the AIS 3+ injury risk used to set the thorax rib deflection limit in the GTR.
12. NHTSA to investigate possibilities for improvement in the robustness of the VC injury risk curves through use of additional research data.
13. NHTSA to advise group of outcome of further work to determine if there are any reasons for the retention of a 3ms pelvis acceleration criteria requirement in the GTR.
14. NHTSA to propose wording that would allow alternative levels of stringency to be applied (e.g. option of 26 km/h test or 32 km/h test with sunset clause) for Kei cars as specifically provided for in Article 4, paragraph 4.2 of the 1998 Agreement.
15. NHTSA to advise why the transmissions of manual and automatic vehicles are required to be placed in different gears (i.e. second vs. neutral gear) in FMVSS 214.
16. Australia to revise draft regulatory text to allow non-fuel system fluids to simply be replaced by equivalent ballast mass, similar to the equivalent paragraph in UN R95 (SEE DRAFT GTR submitted as an informal document to GRSP - <a href="#">GRSP-51-16</a> ).
17. Australia to draft appropriate vehicle test attitude clauses into the GTR regulatory text based on vehicle test attitude requirements of FMVSS 214 ((SEE DRAFT GTR submitted as an informal document to GRSP - <a href="#">GRSP-51-16</a> , ANNEX 1 PARA 3.5-10).
18. UK to suggest improved wording for the ignition paragraph of the vehicle passenger compartment adjustment section of Annex 1, to better account for compression ignition and electric vehicles.
19. Australia to draft simplified wording for paragraph 6.2 of the GTR regulatory text (to improve clarity and reduce opportunity for confusion) in which the angle of impact is defined in terms of one $75^\circ \pm 3^\circ$ angle for both left and right side impact tests (SEE DRAFT GTR submitted as an informal document to GRSP - <a href="#">GRSP-51-16</a> , ANNEX 1 PARA 6.2-3 AND ANNEX 5).