

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

Held at OICA

4 rue de Berri, 8ème arrondissement, Paris, France

20-21 November 2012

Attendees

Name	Organization
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)
Suzanne Tylko	Transport Canada
Hans Ammerlaan	RDW Netherlands
Richard Damm	Germany – Federal Ministry of Transport
Jim Hand	United Kingdom – Department for Transport
Peter Broertjes	European Commission
EunDok Lee	KATRI
Deaup Kim	KATRI
Yoshinori Tanaka	NTSEL – Japan
Jean-Philippe Lepretre	UTAC
Pascal Delannoy	Safran Engineering / UTAC
Ansgar Pott	OICA / Hyundai Motor Europe Technical Center
James Abraham	Ford Motor Company
Peter Davis	SMMT
Philipp Wernicke	BMW Group
Thomas Löw	Audi AG
Christian Wegeleben	Daimler
Andre Haas	Daimler
Martin Delin	Volvo
Akihiko Akiyama	Honda
Karsten Hallbauer	Takata
Irina Dausse	Renault
Myriam Constant	PSA Peugeot Citroen
Cyril Chauvel	LAB
Audrey Petitjean	CEESAR

Online/Phone

Mary Versailles	NHTSA, US Department of Transportation
Stephen Ridella	NHTSA, US Department of Transportation
Lan Xu	Chrysler

1. Welcome and introductions

(Attendees as noted above)

2. Adoption of the agenda

The agenda circulated by the chairman immediately prior to the meeting was adopted with the addition at the request of participants of an item on the draft Chinese standard on pole side impact, the addition of an ISO injury risk curve presentation and a presentation from LAB on costs and benefits ([PSI-08-01](#)).

3. Minutes and actions from the 7th meeting

The minutes ([PSI-08-02](#)) of the seventh meeting held in Washington DC and circulated by the chairman prior to the meeting were agreed.

Mr Hogan summarized the action list from the 7th meeting of the informal working group on pole side impact, noting the work that had been done with respect to each action item.

4. Future work and timetable

Mr Hogan advised that, at the November 2012 WP.29 meeting, AC.3 had specified end dates for the mandate of each informal working group, where not already specified, and had agreed that the informal working group on pole side impact (phase 1) should be officially mandated to continue up until March 2014.

Mr Hogan said that Australia's aim was to submit the 3rd progress report of the informal working group, including the draft gtr, as an informal document for GRSP in December 2012 and requested comments from members on the gtr by 4 December 2012. He noted that Australia would also invite comment at GRSP as well as by email up until the end of January 2013. At least one online drafting session would then be held in late January and/or early February 2013 to enable the gtr to be submitted as a working document for the May 2013 GRSP. Mr Hogan then presented a timetable (see [PSI-08-03](#)) for the submission of documents to GRSP and WP.29 that would need to be followed for the gtr to be adopted at the November 2013 WP.29 meeting.

5. Draft Chinese standard on pole side impact

Mr Hogan advised that he had recently received a copy of a draft Chinese national standard on pole side impact and was trying to obtain further information.

It was noted that this standard might be a voluntary standard.

No informal group members were able to advise whether the standard was intended to be mandatory or voluntary or what the scope/purpose of the standard would be.

6. MUARC report

Mr Hogan requested comments by November 30 on the draft MUARC report circulated to members of the informal working group the week prior to the meeting (see [PSI-08-04](#)). Mr Hogan particularly encouraged Contracting Parties whose national data was used in the report, to review the document. Mr Hogan noted that the report was a report of an independent research institution, rather than of the informal working group itself. The report was intended to provide authoritative data, but the informal working group would not be obliged to agree with or reproduce all of its conclusions.

ACTION: Australia to circulate final MUARC report to members of the informal group (when available).

7. WorldSID update

Ms Tylko and Ms Versailles provided a summary of the informal working group on the harmonization of side impact dummies (WorldSID) meeting held the previous day. (Refer to the minutes of the 10th WorldSID meeting for further details).

8. Major gtr issues

8.1. Progress on the Mutual Resolution

Mr Hogan advised that the repository for test tools used in UN Regulations and UN gtrs had been renamed the “Mutual Resolution” and had been adopted by WP.29 during the November 2012 session (see [ECE/TRANS/WP.29/1101](#)).

8.2. Scope

Mr Abraham and Mr Pott presented a proposal from OICA for the preamble of the gtr ([PSI-08-05](#)), an OICA analysis of GIDAS pole side impact crashes involving light commercial vehicles ([PSI-08-06](#)) and OICA’s proposed scope for the gtr regulatory text ([PSI-08-07](#)). OICA’s GIDAS analysis concluded that pole side impact crashes were rare for light commercial vehicles. Mr Abraham also referred to a study of accidents, injuries and safety priorities for light goods vehicles in Great Britain, which it was agreed would be given an informal working group on pole side impact document number ([PSI-08-13](#)).

Mr Hogan noted that much of the text proposed by OICA had recently been absorbed into the preamble of the gtr, including a criterion Contracting Parties may use to exempt Category 1-1 passenger vans/buses and Category 2 goods vans and light trucks from the gtr, where warranted by national safety need data. Mr Hogan stated that relative safety need and benefits for particular vehicle categories were a matter for each Contracting Party to consider when implementing the gtr in domestic regulation.

In relation to the analysis of GIDAS pole side impact crashes involving light commercial vehicles, Mr Hogan and Mr Terrell noted that the gtr on pole side impact would produce benefits through a reduction in head injuries sustained by light commercial vehicle occupants in other side impacts as well as pole side impacts.

8.3. WorldSID 50th Male Seating Procedure

Ms Tylko advised that ISO were in the process of finalising a WorldSID 50th percentile adult male seating procedure, with the ballot for the ISO standard due to close on 4 December 2012. Subject to a positive ballot outcome, publication would be expected to occur in the New Year.

Mr Hogan advised that he, Mr Belcher and Ms Versailles had met with ISO during the previous week in Geneva, regarding incorporation of ISO seating procedure text in the gtr. ISO had indicated in-principle agreement on the basis that the seating procedure was to be used in regulation, subject to confirmation and subject to appropriate acknowledgement of the role of ISO being included in the preamble of the gtr.

Mr Belcher noted that the most recent draft ISO seating procedure allowed the H-point and torso/seat back angle to be determined using either the existing regulatory 3-D H machine (i.e. OSCAR/HPM-I) or a HPM-II.

Ms Constant advised that GRSP had previously investigated the equivalence between the H-point coordinates determined using each type of machine.

The consensus within the informal group was that GRSP was unlikely to agree to the use of the HPM-II in regulation at the May 2013 meeting. It was also noted that any (potential) regulatory use of this machine may need to be considered in a broader context, as H-point machines are used in a number of regulations, including passive and general safety regulations. The HPM-II would also be likely to be treated as a “new test tool” and GRSP delegates have previously indicated a preference for specifications (i.e. masses, dimensions and materials of construction) of new test tools to be included in an Addendum to the Mutual Resolution.

Mr Belcher noted that the seating procedure text would need to specify the existing regulatory 3-D H Machine (i.e. SAE J826 1995 version), for which the procedures for H-point and actual torso angle determination text from gtr no. 7 and UN regulations 94 and 95 could be adapted to suit the WorldSID 50th male seating procedure developed by ISO.

8.4. Injury Thresholds

Ms Petitjean presented a summary of the ISO/WG6 WorldSID 50th percentile adult male injury criteria recommendations ([PSI-08-08](#)). In particular, this presentation noted that the abdominal injury criteria in the draft gtr did not correspond to the recommendations of ISO/WG6.

Mr Belcher advised that the abdominal rib deflection limit had been set to 58 mm in the gtr regulatory text because the WorldSID 50th male ribs would not be physically capable of deflecting 80 mm (50% AIS 2+ abdominal injury risk for a 45 year old male), and 58 mm was the limit ISO/WG6 had previously recommended for 50% AIS 3+ thorax injury risk as a function of the maximum thorax or abdominal rib deflection. Mr Belcher therefore noted that an 80 mm deflection limit might effectively allow substantially more severe loadings of the abdomen than are typical for current production vehicles. This could be used to offload the thorax.

Ms Petitjean advised that a 65 mm WorldSID 50th male abdominal rib deflection limit would be equivalent (in terms of AIS 3+ injury risk) to the 2.5 kN total (sum of the front, middle and rear) internal abdominal force limit used as the abdominal performance criteria threshold limit for the ES-2 in Regulation No. 95 and the ES-2re in FMVSS 214.

It was agreed to change the abdominal rib deflection limit for the WorldSID 50th male in the draft gtr to 65 mm.

Mr Hogan noted that the reasoning behind the retention of the 3 ms lower spine acceleration criterion had been explained as follows in the preamble of the draft gtr:

“While ISO WG6 preferred abdominal rib deflection as the best predictor of abdominal injury risk, the lower spine acceleration criterion has also been included because it may in some specific circumstances detect severe lower thorax and abdominal loadings a 1-dimensional abdominal rib deflection criterion may not. This concern may be addressed in the future by the introduction of 2-dimensional rib deflection criteria, but in the meantime this acceleration based criterion is expected to detect unusual loadings, such as excessive airbag loadings from behind the dummy, without requiring vehicle design changes for normal load conditions”.

Mr Ammerlaan presented a shoulder assessment criteria proposal ([PSI-08-09](#)) developed in consultation with OICA/VDA.

A number of informal group members considered that it would be premature to include a shoulder criterion using a shoulder stop. It was agreed that the inclusion of a shoulder stop may be able to be considered as part of phase 2.

It was decided to include a lateral shoulder force limit for the WorldSID 50th male in the draft gtr. This limit was set at approximately 20% higher than the peak WorldSID 50th male lateral shoulder loads recorded for current production vehicles tested by NHTSA in 32 km/h oblique pole side impact. This would prevent substantially greater shoulder loads than occur for current model vehicles from being used to offload the thorax of the dummy in a non-biofidelic way. Australia, Transport Canada, BMW, Audi/VW, RDW and NHTSA representatives indicated they would further investigate shoulder force responses in vehicle-to-pole side impact crash tests to confirm the suitability of this criterion prior to finalisation of the gtr.

It was agreed that [PSI-08-09](#) would be used as the basis for an explanation of the rationale of the WorldSID 50th male shoulder performance criterion, which would be drafted by Australia for the preamble of the gtr.

ACTION: Australia, Transport Canada, BMW, Audi/VW, RDW and NHTSA to further investigate shoulder force responses for finalisation of the shoulder criterion.

9. Detailed consideration of draft regulatory text (Part II of the gtr)

The draft gtr regulatory text circulated by the chairman prior to the meeting ([PSI-08-11](#)) was considered in detail by the informal working group including line-by-line consideration of paragraphs with square brackets (i.e. paragraphs requiring agreement). Mr Belcher summarized each change proposed to the draft gtr regulatory text (Part II)

since the 7th meeting.

Extensive discussions were held regarding the parking brake and transmission adjustment requirement in the gtr. The consensus view was that the main function of both prescriptive requirements was to limit movement of the vehicle prior to impact with the pole, and therefore maximise accuracy of the impact location. As the gtr includes a performance requirement for impact alignment accuracy it was agreed that the requirements for parking brake and transmission were unnecessary. However, in order to maintain a consistent test configuration and minimise testing problems the group agreed to include a requirement that the parking brake be engaged. Requirements on transmission engagement were not included as these appeared inconsistent within the requirement and incompatible with some modern vehicle drivetrains. The group agreed that transmission setting would have no effect on the result of a test.

Ms Versailles advised that NHTSA had examined the alignment accuracy achieved in FMVSS 214 pole tests and found a small minority of tests conducted were outside the alignment tolerance (± 25 mm) specified in the draft gtr. NHTSA were also unable to agree the 1.5 m/s^2 maximum vehicle acceleration limit in paragraph 6.6 of Annex 1. Mr Hogan requested that NHTSA consider its position on both requirements further. In the meantime, it was agreed to leave the requirements in square brackets, with Australia to draft an explanation for the requirements as they stood in the preamble.

ACTION: NHTSA to further consider proposal for $\pm 25\text{mm}$ tolerance applied to the impact alignment in paragraph 6.5 of Annex 1.

ACTION: NHTSA to further consider proposal for 1.5 m/s^2 maximum vehicle acceleration limit in paragraph 6.6 of Annex 1.

10. Cost-benefit study, French data (LAB presentation)

Mr Lepretre and Mr Chauvel presented a LAB analysis of benefits and costs in France for vehicles designed to achieve a baseline EuroNCAP (13 side impact points) performance rating and vehicles designed to meet the gtr on pole side impact performance requirements ([PSI-08-10](#)).

Mr Hogan noted that the fatality and serious injury costs used in the LAB analysis were substantially lower than had been used in other analyses, including the MUARC analysis. Mr Hogan noted that head injuries were very common in both pole side impacts and other side impacts and that MUARC had reported AIS 3 and AIS 4+ head injury costs for Australia of \$AU 3.7 Million and \$AU 4.8 Million respectively, based on accident insurance data.

Mr Chauvel advised that the serious injury costs in the LAB analysis were average serious injury costs and did not differentiate costs by body region. Mr Hogan suggested lifetime costs resulting from serious and severe head injuries in Europe were likely to be comparable to Australia and hence much higher than the average serious injury cost.

Mr Hogan indicated that benefit cost analysis on implementation of the gtr would need to reflect the high costs associated with serious and severe head injuries rather than use

average injury figures. He also emphasised that benefit cost analysis would need to encompass benefits from the gtr in other side impacts as well as in pole side impacts.

11.Detailed consideration of preamble (Part I of the gtr)

Mr Hogan summarized the preamble of the draft gtr ([PSI-08-12](#)) and requested any comments by 4 December, to allow consideration prior to submission of the gtr as an informal document for the December 2012 GRSP.

12.Other Business

No other business was discussed at this meeting.

13.Next Meetings

Mr Hogan noted that this (8th) meeting would probably be the last face-to-face meeting of the informal working group for phase 1 of the gtr on pole side impact. Further online drafting meetings would be held as required prior to the May 2013 GRSP.

He thanked the group for its efforts and said that it had been pleasure to work with them over the last two years.

SUMMARY OF ACTIONS

1. Australia to circulate final MUARC report to members of the informal group (when available).
2. NHTSA to further consider proposal for $\pm 25\text{mm}$ impact alignment tolerance in paragraph 6.5 of Annex 1.
3. NHTSA to further consider proposal for 1.5 m/s^2 maximum vehicle acceleration limit in paragraph 6.6 of Annex 1.
4. Australia, Transport Canada, BMW, Audi/VW, RDW and NHTSA to further investigate shoulder force responses for finalisation of shoulder criterion.