

Final Report of the Informal Working Group on a Pole Side Impact GTR

Introduction

The intention of this report is to supplement procedural information on the development of the gtr included in the Part I (Statement of technical rationale and justification) of the gtr and to provide further details on the informal working group.

For information on the technical rationale and justification of the gtr, readers are referred to Part I the gtr.

Procedural Background

At the 150th session of the World Forum for Harmonization of Vehicle Regulations (WP.29) in March 2010, the representative from Australia introduced an informal document (WP.29-150-11), proposing the development of a global technical regulation (gtr) on pole side impact. There were five key elements to this proposal, namely that:

- (a) a high number of fatalities occurred in pole side impacts (that is, impacts with narrow objects such as telegraph poles, signposts and trees) and other side impacts in Australia and other countries;
- (b) there was wide variation between side and pole side crash tests both in regulations and voluntary standards;
- (c) there was wide variation between the crash dummies being used in the crash tests and concerns over their biofidelity, raising concerns about their effectiveness in predicting real world injury outcomes;
- (d) the development of the WorldSID 50th percentile adult male dummy, with its superior biofidelity, provided a unique opportunity to improve the international crash test regime for side impacts through development of a gtr on pole side impact, thereby improving the safety of vehicle users and minimising costs to consumers and industry; and
- (e) a pole side impact standard was likely to produce benefits for side impacts generally by driving improvements in head protection.

The Executive Committee of the 1998 Agreement (AC.3) requested the secretariat of WP.29 to distribute WP.29-150-11 with an official symbol for consideration and vote at its June 2010 session. It was agreed to transmit WP.29-150-11 to the Working Party on Passive Safety (GRSP) to consider at its May 2010 session and to assess the need for establishing an informal working group.

At its forty-seventh session in May 2010, GRSP considered an official proposal made by the expert from Australia (ECE/TRANS/WP.29/2010/81) together with a further Informal document (GRSP-47-28), which included a proposed task list (subsequently developed into terms of reference), and endorsed the establishment of an informal working group under the chairmanship of Australia, subject to the consent of AC.3.

At the 151st session of WP.29 in June 2010, AC.3 considered an official proposal tabled by the representative from Australia and agreed to develop the gtr and to establish the informal working group. AC.3 also agreed that the initial tasks of the informal working group should be to:

- (a) confirm the safety need for a gtr in light of the increasing prevalence of electronic stability control in the vehicle fleet; and
- (b) simultaneously assess potential candidate crash test standards to be addressed by the proposed gtr. The proposal was included in the list of proposals for developing gtrs, adopted by AC.3 (ECE/TRANS/WP.29/AC.3/28).

At the 154th session of WP.29 in June 2011, AC.3 adopted the terms of reference of the informal working group and its first progress report (ECE/TRANS/WP.29/2011/87).

At the 157th session of WP.29 in June 2012, AC.3 adopted the second progress report of the informal working group, together with a change to the terms of reference of the informal working group to clearly provide for a second phase of the development of the gtr to incorporate the WorldSID 5th percentile adult female (ECE/TRANS/WP.29/2012/59). The amended terms of reference are provided at Annex 1.

At the fifty-first session of GRSP in May 2012, the informal working group submitted an initial draft of part II of the gtr (GRSP-51-16).

At the 158th session of WP.29 in November 2012, AC.3 agreed to fix the mandate for the first phase of the informal working group until March 2014, on the basis that an official draft of the gtr would be considered by AC.3 in November 2012, but that delays were possible. It was also noted that as the timetable to validate the WorldSID 5th percentile adult female was unclear, a proposal for the deadline of the second phase would be brought forward separately.

At the fifty-second session of GRSP in December 2012, the informal working group submitted an initial draft of Part I and a further developed draft of Part II of the gtr (GRSP-52-07).

At the fifty third session of GRSP in May 2013, the informal working group submitted the *Proposal for a global technical regulation on Pole Side Impact* (ECE/TRANS/WP.29/GRSP/2013/7) and the *Proposal for amendments to ECE/TRANS/WP.29/GRSP/2013/7* (GRSP-53-05).

GRSP substantially agreed the proposed amendments to *ECE/TRANS/WP.29/GRSP/2013/7* contained in GRSP-53-05 and made a number of other amendments to the text. These changes are shown in revision marking mode in GRSP-53-23. GRSP adopted *ECE/TRANS/WP.29/GRSP/2013/7* as amended by GRSP-52-23, so it could be provided as a working document for consideration by AC.3 in November 2013.

Details of the Informal Working Group

The informal working group conducted the following meetings:

- 1st meeting, Bonn, 16-18 November 2010
- 2nd meeting, Brussels, 3-4 March 2011
- 3rd meeting, Washington, 9 June 2011
- 4th meeting, Seoul, 27-28 October 2011
- 5th meeting, London, 22-23 March 2012

Deleted: ,

- 6th meeting, Munich, 20-21 June 2012
- 7th meeting, Washington, 20-21 September 2012
- 8th meeting, Paris, 20-21 November 2012

The informal working group also held a drafting session by webex on 7 February 2013.

Meetings were attended by representatives of: Australia, Canada, China, the European Commission, France, Germany, Japan, the Netherlands, the Republic of Korea, the United Kingdom, the United States of America, and the International Organisation of Motor Vehicle Manufacturers (OICA).

A number of other organisations, particularly research bodies, attended various meetings and documents were circulated to an extensive mailing list.

The meetings were chaired by Mr Robert Hogan and the Secretariat and technical support was provided by Mr Thomas Belcher and Mr Mark Terrell, from the Australian Department of Infrastructure and Transport.

The gtr informal working group has worked in close conjunction with the informal working group on harmonization of side impact dummies (WorldSID group) and generally meetings of the WorldSID group have been held immediately before meetings of the gtr group, enabling participants to attend both meetings.

A large number of documents have been referred to or developed by the informal working group, including minutes and presentations, which - taken together with the documents submitted to GRSP - provide a chronology of development of the gtr. These documents are listed in Annex 2 and are available on the UNECE website at:
<https://www2.unece.org/wiki/pages/viewpage.action?pageId=3178630>

ANNEX 1

Revised Terms of Reference

The major tasks that will be performed by an Informal Working Group include:

- (a) Review of existing research, including crash tests, and literature;
- (b) Liaison with, and consideration of the results of, the GRSP WorldSID Informal Working Group;
- (c) Assessment of safety need, including analysis of current fatalities and injuries from pole side impact, other side impacts and rollovers, taking account of positive safety developments already occurring or likely such as ESC; and target vehicle categories to be taken into consideration;
- (d) Examination of possible test procedures;
- (e) Consideration of variations to candidate test procedures;
- (f) Establishment of likely countermeasures driven by shortlisted test procedures;
- (g) Calculation of likely injury mitigation coverage of the crash and injury population from these countermeasures;
- (h) Assessment of benefits and costs for shortlisted test procedures (including data from a significant range of countries, as there may be wide variations in benefits);
- (i) Assessment of likely incremental benefits and costs from, e.g., testing for smaller (5th percentile female) and non-struck side and rear seat occupants;
- (j) Selection of a preferred test procedure; and
- (k) Production of a draft global technical regulation phase 1 (WorldSID 50th percentile male) for consideration by GRSP and subsequently WP.29. ; and
- (l) Production of a draft global technical regulation phase 2 (WorldSID 5th percentile female) for consideration by GRSP and subsequently WP.29.

ANNEX 2

Papers from Meetings of the Informal Working Group

RD-01	National Highway Traffic Safety Administration (NHTSA): 49 CFR Parts 571 and 585 Federal Motor Vehicle Safety Standards; Occupant Protection in Interior Impact; Side Impact Protection; Fuel System Integrity; Electric-Powered Vehicles: Electrolyte Spillage and Electrical Shock Protection; Side Impact Phase-In Reporting Requirements; Final Rule (2007)
RD-02	NHTSA (Office of Regulatory Analysis and Evaluation, National Centre for Statistics and Analysis): FMVSS No. 214 Amending Side Impact Dynamic Test: Adding Oblique Pole Test (2007)
RD-03	NHTSA & Abacus Technology Corporation: NHTSA Side Impact Research: Motivation for Upgraded Test Procedures
RD-04	NHTSA: 49 CFR Parts 571 and 598 Federal Motor Vehicle Safety Standards; Side Impact Protection; Side Impact Phase-In Reporting Requirements; Proposed Rule (2004)
RD-05	NHTSA: 49 CFR Parts 571 and 585 [Docket No. NHTSA–2008–0104] RIN 2127–AK27 Federal Motor Vehicle Safety Standards; Occupant Protection in Interior Impact; Side Impact Protection; Side Impact Phase-In Reporting Requirements (2008)
PSI-01-01	Draft Agenda for the First Meeting of the GRSP Informal Group on a Pole Side Impact GTR
PSI-01-02	Request for Country Data
PSI-01-03	Pole Definition
PSI-01-04	Summary of Existing Crash Test and Simulation Data
PSI-01-05	GRSP Informal Group on a Pole Side Impact GTR (WP29 and GRSP Decisions, Draft Procedures and Terms of Reference)
PSI-01-06	Agenda for the first meeting of the GRSP Informal Group on a Pole Side Impact GTR
PSI-01-07	Australian Department of Infrastructure and Transport: Pole Side Impact GTR: Assessment of Safety Need: Initial Data Collection
PSI-01-08	German Federal Highway Research Institute (BASt): Influence of Vehicle Stability Control on Accidents on Rural Roads – GRSP Informal Group on a Pole Side Impact GTR

PSI-01-09	Australian Department of Infrastructure and Transport & Monash University Accident Research Centre (MUARC): Evaluating Vehicle Technologies – Electronic Stability Control Using Australian Used Car Safety Ratings Data
PSI-01-10	NHTSA: US Side Impact Pole Test – Federal Motor Vehicle Safety Standard No. 214
PSI-01-11	European Enhanced Vehicle-safety Committee (EEVC) Working Group 13 & Working Group 21: Accident Data: Side Impacts with Poles
PSI-01-12	Australian Department of Infrastructure and Transport: Summary of available test data
PSI-01-13	Australian Department of Infrastructure and Transport: Summary of current pole tests
PSI-01-14	Transport Canada: Pole Test Comparison of the WorldSID IRTRACC, WorldSID Rib-EYE & ES2-re
PSI-01-15	Australian Department of Infrastructure and Transport: Australian Pole Side Impact Research 2010 – A summary of recent oblique, perpendicular and offset perpendicular pole side impact research with WorldSID 50th
PSI-01-16	NHTSA: Calculating Benefits for Oblique Pole Side Impact Rulemaking
PSI-01-17	EEVC Working Group 13 & Working Group 21: Cost/Benefit of Side Impact Test Procedures
PSI-01-18	Transport Canada: WorldSID Positioning – Sub-Committee Update
PSI-02-01	Draft Agenda for the 2 nd Meeting of the GRSP Informal Group on a Pole Side Impact GTR
PSI-02-02	First Progress Report of the Informal Group on a Pole Side Impact (PSI) GTR
PSI-02-03	Minutes of the First Meeting of the GRSP Informal Group on a Pole Side Impact GTR
PSI-02-04	Agenda for the 2 nd meeting of the GRSP Informal Group on a Pole Side Impact GTR
PSI-02-05	NHTSA: FMVSS No. 226 – Ejection Mitigation Final Rule
PSI-02-06	Australian Department of Infrastructure and Transport: Pole Side Impact GTR: Assessment of Safety Need: Updated Data Collection
PSI-02-07	Renault & PSA Peugeot Citroen: Pole Side Impact Accident Data – France National & LAB Data
PSI-02-08	Australian Department of Infrastructure and Transport: Application/Scope of PSI GTR (draft for discussion)
PSI-02-09	APROSYS: Car to Pole Side Impact Activities
PSI-02-10	NHTSA: WorldSID Crash Testing

- PSI-02-11 NHTSA: Discussion of Injuries in Pole Side Impact Crashes – NHTSA’s Motivation for Upgrading the Side Impact Test Procedures & Benefit Analysis
- PSI-02-12 BAST: Accident Data: Side Impacts with Poles – Informal Group on a Pole Side Impact GTR (PSI)
- PSI-02-13 Australian Department of Infrastructure and Transport: Analysis of Vehicle Structural Deformation in Oblique, Perpendicular, and Offset Perpendicular Pole Side Impact
- PSI-02-14 NHTSA: Real World Need for Oblique Test
- PSI-02-15 ISO/WG6 & ACEA-TFD: Update on the WorldSID Injury Risk Curves
- PSI-02-16 Australian Department of Infrastructure and Transport: Fatalities and Serious Injuries in Side Impact Crashes by Age – Victoria, Australia, 2000-2009
- PSI-02-17 University of Michigan Transportation Research Institute: Effects of Occupant Age on AIS 3+ Injury Outcome Determined from Analyses of Fused NASS/CIREN Data
- PSI-02-18 BMW Group: Side Pole Impact Accidents and Vehicle Testing
- PSI-02-19 Australian Department of Infrastructure and Transport: Research Proposal – Quantitative analysis of Side Impact injuries, and effectiveness of existing countermeasures; Extension of existing work on side airbag effectiveness
- PSI-03-01 Agenda for the 3rd Meeting of the GRSP Informal Group on a Pole Side Impact GTR
- PSI-03-02 Minutes of the Second Meeting of the GRSP Informal Group on a Pole Side Impact GTR
- PSI-03-03 Australian Department of Infrastructure and Transport & Transport Canada: Joint Australian and Canadian Pole Side Impact Research
- PSI-03-04 Australian Department of Infrastructure and Transport: Pole Side Impact GTR: Assessment of Safety Need: Updated Data Collection
- PSI-03-05 Australian Department of Infrastructure and Transport: Fatalities and Serious Injuries in Side Impact Crashes by Impact Type, Occupant Age and Year of Vehicle Manufacture, Victoria, Australia, 1999-2010
- PSI-03-06 NHTSA: Incremental Benefits Perpendicular to Oblique Configuration
- PSI-03-07 MUARC: Data Analysis to Investigate the Injury Profile of Near-Side, Side Impact Crashes: a Comparison of Injury Risk between Pole and Vehicle-Vehicle Impacts
- PSI-03-08 Australian Department of Infrastructure and Transport: Scope of the UN GTR (draft for discussion)
- PSI-03-09 Australian Department of Infrastructure and Transport: Options for the 5th Female
- PSI-03-10 BAST: Accident Data: Side Impacts with Poles
- PSI-03-11 BMW Group: WorldSID 50M – Injury Criteria

PSI-03-12	NHTSA: Repeatability of Oblique Test Configuration
PSI-04-01	Agenda for the 4th Meeting of the GRSP Informal Group on a Pole Side Impact GTR
PSI-04-02	Minutes of the Third Meeting of the GRSP Informal Group on a Pole Side Impact GTR
PSI-04-03	Australian Department of Infrastructure and Transport: Joint Australian and Canadian Pole Side Impact Research
PSI-04-04	French Technical Union for the Automobile, Motorcycle and Cycle Industries (UTAC): 4th Meeting of the GRSP Informal Group on Pole Side Impact GTR
PSI-04-05	Australian Department of Infrastructure and Transport: Safety Need – High Level Figures
PSI-04-06	Australian Department of Infrastructure and Transport: GTR Scope – N1 Occupant Fatalities in Australia
PSI-04-07	Australian Department of Infrastructure and Transport: Options for Addressing Gap in Readiness between WorldSID Male 50th and WorldSID Female 5th in Drafting the Pole Side Impact GTR
PSI-04-08	Australian Department of Infrastructure and Transport: Analysis of Australian National Crash In-Depth Study (ANCIS) Pole Side Impact Cases by Angle of Impact
PSI-04-09	NHTSA: Exclusions (in FMVSS 214)
PSI-04-10	OICA: Scope of GTR – Pole Side Impact – Commercial Vehicle Use and Data
PSI-04-11	JASIC/Japan: Japanese Proposal and Research Plan
PSI-04-12	Australian Department of Infrastructure and Transport: Draft Outline of Preamble of the UN GTR
PSI-04-13	Australian Department of Infrastructure and Transport: Draft Text of the Regulation of the UN GTR (NB a revised draft of this text was circulated to PSI Informal Group members on 4 November 2011 as a working document)
PSI-05-01	Agenda for the 5th Meeting of the GRSP Informal Group on a Pole Side Impact GTR
PSI-05-02	Minutes of the Fourth Meeting of the GRSP Informal Group on a Pole Side Impact GTR
PSI-05-03	MUARC: Analysis of In-depth and Mass Crash Data to Inform the Development of the Pole Side Impact Global Technical Regulation
PSI-05-04	BASt: Pole Side Impact Accidents in Germany
PSI-05-05	Australian Department of Infrastructure and Transport & Transport Canada: Joint Australian and Canadian Pole Side Impact Research
PSI-05-06	JASIC/Japan: Research TEST Result & Japanese Proposal

PSI-05-07	OICA: Pole Side Impact Protection – Cost Data – Based on Studies from EEVC and NHTSA
PSI-05-08	Australian Department of Infrastructure and Transport: Safety Need – High Level Figures
PSI-05-09	OICA: Scope of GTR – Pole Side Impact – Exemption of Commercial Vehicles
PSI-05-10	Australian Department of Infrastructure and Transport: The Importance of Pole Side Impact Alignment Accuracy
PSI-06-01	Agenda for the 6th Meeting of the GRSP Informal Group on a Pole Side Impact GTR
PSI-06-02	Minutes of the Fifth Meeting of the GRSP Informal Group on a Pole Side Impact GTR
PSI-06-03	MUARC: Further Injury Risk Analysis and the Cost-effectiveness of Enhanced Side Impact Protection in the Form of a GTR for PSI Crashes
PSI-06-04	Australian Department of Infrastructure and Transport & Transport Canada: Joint Australian and Canadian Pole Side Impact Research
PSI-06-05	UTAC: Pole Side Impact Test on European Berline
PSI-06-06	Australian Department of Infrastructure and Transport: Safety Need – High Level Figures
PSI-06-07	Australian Department of Infrastructure and Transport: Category 2 Vehicles: Australian Sales and Safety Need Data
PSI-06-08	ISO WorldSID 50th Task Group: Update to GTR Pole Side Impact
PSI-06-09	NHTSA: WorldSID 50th TEG: Status Report
PSI-06-10	Medical College of Wisconsin: Preliminary Analysis of Shoulder Traumas from the CIREN Database
PSI-06-11	Audi: Occupant Loading in Pole Side Impact
PSI-06-12	NHTSA: Pole Side Impact Vehicle Tests: WorldSID Dummy Data
PSI-06-13	Australian Department of Infrastructure and Transport & Transport Canada: Summary of Rib Deflection Responses
PSI-07-01	Agenda for the 7th Meeting of the GRSP Informal Group on a Pole Side Impact GTR
PSI-07-02	Minutes of the Sixth Meeting of the GRSP Informal Group on a Pole Side Impact GTR
PSI-07-03	Australian Department of Infrastructure and Transport & Transport Canada: Joint Australian and Canadian Pole Side Impact Research
PSI-07-04	Korea Automobile Testing & Research Institute: Evaluation of WS and ES2 Dummy in Pole Side Impact

PSI-07-05	Medical College of Wisconsin: Deflection Responses from PMHS in Oblique Side Impact Sled Tests
PSI-07-06	Medical College of Wisconsin & NHTSA Vehicle Research Test Centre: WorldSID Abdomen Tests
PSI-07-07	OICA: Proposal for PSI GTR Scope
PSI-07-08	OICA: Van and Passenger Car Dimensions
PSI-07-09	OICA: Preamble Text for Pole Side Impact Global Technical Regulation
PSI-07-10	Japanese Proposal for Narrow Vehicles (Kei Cars, Etc.) (Impact Velocity)
PSI-07-11	Beyond Safe – Bringing Physics into Models: Effect of Seating Height in Side Impact
PSI-07-12	RDW: Shoulder Loading of WorldSID 50th
PSI-07-13	BMW Group: WorldSID 50% Shoulder Assessment – Industry Proposal 8th Meeting
PSI-08-01	Agenda for the 8 th Meeting of the GRSP Informal Group on a Pole Side Impact GTR
PSI-08-02	Minutes of the Seventh Meeting of the GRSP Informal Group on a Pole Side Impact GTR
PSI-08-03	GTR on Pole Side Impact: Timetable
PSI-08-04	MUARC: Assessment of the Need for, and the Likely Benefits of, Enhanced Side Impact Protection in the Form of a Pole Side Impact Global Technical Regulation
PSI-08-05	OICA: Preamble to GTR Pole Side Impact Scope Discussions
PSI-08-06	OICA: GIDAS Accident Analysis Pole Side Impact with CVs
PSI-08-07	OICA: Proposed Scope
PSI-08-08	WorldSID 50th Injury Risk Curves
PSI-08-09	Rationale Behind the Shoulder Assessment Criteria for WorldSID
PSI-08-10	LAB: Pole Side Impact Cost/Benefit Study, French Data
PSI-08-11	Draft Text of the PSI Regulation
PSI-08-12	Draft Preamble – Global Technical Regulation No. XX Pole Side Impact
PSI-08-13	Lenard, J., Frampton, R., Kirk, A., Morris, A., Newton, R., Thomas, P., Fay, P.: Accidents, Injuries and Safety Priorities for Light Goods Vehicles in Great Britain