Minutes of 3rd meeting of the Informal Group on Child Restraint System

Held at SMMT, London
13th May 2008

1 Welcome and Introductions

Pierre Castaing opened the meeting and welcomed the delegates.
Mr Mike Hyatt, Head of Technical Department of SMMT kindly welcomed participants and whished them a constructive and fruitful discussion. PC thanked Mr Hyatt for hosting the meeting and for SMMT hospitality.

2 Roll call

Due to new participants' attendance to the group, a roll call of all participants was done.

Attendees and Apologies for Absence: See Annex 1

3 Approval of Agenda

Doc. INF GR / CRS-3-1

Craig Newland, from Australia proposed to add two presentations. The first presentation concerns the classification of CRSs and the second is about Australian Standard and its recent update.
Suzanne Tylco from Transport Canada announced a presentation on side impact protection.

The draft agenda was approved with those additions.

4 Approval of the Minutes of last meeting

The Minutes were reviewed.

- Comment regarding the web link in page 4, item 5.2.2, the correct link is www.childincarsafety.org

Minutes were approved without other comments.

5 Actions from the Minutes of last meeting

The action list was reviewed. Presentations and discussions followed each item.

5.1 ISO information on the work program of TC 22/SC 12/WG 1 – Child Restraint System in road vehicles

Michèle Maître, from BNA, presented to the group the work program of ISO/TC22/SC12/WG1 regarding CRS in road vehicles (complete document is available UNECE website **Doc. INF_GR / CRS-3-4**).

Following the presentation Pierre Castaing commented that ISO make Standards based on best practices while regulation may use parts of standards or complete standards to define

regulatory texts. So the aim in our case will be to use work available from ISO as well as their support and to find the best compromise between standards and regulations.

5.2 Test bench

5.2.1. NPACS Presentation (Action 1.2 – by TRL)

Doc. INF_GR / CRS-3-5

Marianne Le Claire from TRL presented data from NPACS program. They investigated front seat environment, seat belt geometries and cushion stiffness on thirty popular vehicles from 2001 to 2004 MY.
Stiffness of the vehicle cushions was determined with ECE R44 pendulum that is used to calibrate the cushion stiffness of the test bench. As a result a generic cushion representative of the sample average was developed and applied to the NPACS bench.
Anchorage positions of the bench correspond to the average case position. Details of the study are available on the annex 12 of the report, a copy of which was made available by UK DFT to the group.

Another presentation dealing with comparison between ECE.R44 and NPACS benches will be given during next meeting.

Action TRL

5.2.2. R point versus Cr point Relationship (Action 1.3 – by MPA)

Mr. Beisswaenger mentioned a study carried out by MPA on the position of R point and Cr points in rear seats of cars in relation to Cr point of ECE R44 test bench, using the SAE H-point-machine.
Studies show that the H-point is 89 mm in front of the Cr axis in horizontal direction and 107 mm above the Cr-line in vertical direction.

Doc. INF_GR / CRS-3-6

Mr. Horn presented data from Mercedes vehicles (6 to 8 vehicles) regarding the location of Isofix and top tether anchorages with respect to Cr point. The data are expressed in the vehicle coordinate system and the angle of the seat cushion is taken into account in the measurements. The positions of Isofix and/or top tether anchorages are established in relation to specifications required by regulations (Europe/US/Australia …).
It was shown that Isofix bars are located 9 to 34 mm rearward for Cr and 9 to 6 mm above Cr**.**
TT: XZ, Rear seat back X 250 mm, Z 300, Shelf 400 X Z 600
TT: Y +- 35 mm

Cr vs R point
Cr rearward 96 - 124 mm; 72 – 83 mm below R Point, for 7 cars

Both MPA and Mercedes studies seem to show comparable data (to be checked)

5.2.3. Floor positioning versus R(H) point (Action 1.4 – by OICA)

Doc. INF_GR / CRS-3-7

Measurements were taken with Hybrid III 50th dummy and gave various results depending of the type of vehicle (MPV, Family car, etc.) The group noted that data are generated from current vehicles and do not necessarily represent the future evolution of cars. Regulation is a long term work and the aim of the informal group will be to have an idea of the future in order to ensure that the resulting regulation will not be obsolete during its introduction.

Members of the group noted, for the second time, that an important parameter is missing in the studies discussed so far: it is the position of the vehicle structure beneath the rear seat with respect to Cr point or R point. The current situation regarding CRS anchorages is two points on the seat and a top tether point located somewhere behind or in the rear of the

seat. This might lead to misuse. So to change this situation and to assure the good use of the CRS (and these anchorages) a solution could be to define three fixed anchorages on the vehicle seat.

Craig Newland pointed out that the top tether is currently used in Australia since many years and that consumer is informed and had the correct behavior regarding mounting of CRS on the vehicles. Introduction of new mounting rules or fixations could generate a lot of troubles.

CRS manufacturers have a different position. For them, a third fixed anchorage will be allow to have a homogeneous fixation in all vehicles and will significantly reduce the risk of misuse associated with the child seat to vehicle attachment. In terms of test approval it will be a universal solution to installing CRSs on vehicles, which may or may not be combined with TT.

To conclude this item, it is noted that top tether might be generator of misuse. A solution could be to define a third fixed point on vehicle structure at rear seat or on the floor between front and rear seat. Regarding this second solution we have no indication regarding the force that a support leg could on the floor or on mechanical limits of the floor. The group needs more information.

Action All

5.3 Classification – Load level in Isofix anchorages

Pierre Castaing reminds to members of the group that the first step of our work is to define an '"Isofix Universal Integral" Child Restraint System.

As far as the test method the goal is not to define tests regarding the classification of CRS according to occupant mass (as currently) and available dummies. Instead, based on limits of the CRS, defined and announced by the manufacturers, the aim is to use adapted dummy in size and mass to check the performance of the CRS.

5.3.1 Load level in Isofix Anchorages – CLEPA presentation (Action 1.6)

Doc. INF_GR / CRS-3-17 – to be delivered

This presentation is a first step. Members of CLEPA obtained differences in results of the tests and have to analyze tests and measurements to finalize the study.

Significant differences are checked in right and left anchorages (no symmetrical results)., and there a need to investigate reasons of this deviation. Other members are requested to provide their knowledge/data on forces sustained by Isofix anchorages.
It was noted that the group need information not only on test bench but in vehicles too, because the minimum expected force is known from ECE.R14 tests which are by nature static, not dynamic tests.

5.3.2 Load level in ISOFIX anchorages – OICA presentation (Action 1.6)

Presentation postponed for next meeting.

5.3.3 Australian presentation (by Craig Newland)

Doc. INF_GR / CRS-3-9

In Australia choice of CRS is the responsibility of the consumers. They have some difficulties to find the best CRS due to relation age/size of children. A solution proposed by University of Adelaide is to put indicators on the CRS defining limits (lower and upper) for the height of the child's shoulders. A simple procedure is then required to test the size of the CRS: to check that the dummy's shoulders are positioned inside both markers.

Australia plans to include this feature to the update of AU/NZ 1754. The key task now will be to educate consumers to use this approach in the real-world.

5.3.4 Anthropometric data presentation (by Hans Ammerlaan)

Doc. INF_GR / CRS-3-10

Mr. Ammerlaan presents anthropometric data from CANDAT database that was used to define anthropometry targets for the Q dummies family.

The data shows that the body mass and shoulder height are generally a function of standing height (remark: Q3 dummy is a little bit above the average).

As a result of the discussion it was concluded that the total height could be used as criteria for the CRS choice by consumers.

5.3.5 JPMA and AIAM presentation (by Jim Eaton)

Doc. INF_GR / CRS-3-12

Jim Eaton presented a study conducted in the US by JPMA and AIAM in order to establish the maximum force sustained by the latch bars in frontal impact. The objective is to establish a maximum occupant mass to be used with CRS and to be specified by CRS manufacturers, with no modifications to current latch bar specifications. They used a sled configuration with a convertible CRS and a 6Y old weighted child dummy (65lbs) with a US NCAP type pulse 44 G (Toyota Echo). Preliminary forces obtained are: 8 kN for L and R latch tethers,

Manufacturer Latch WG JPMA Vehicle

5.3.6 Transport Canada research presentation (by Suzanne Tylco)

Doc. INF_GR / CRS-3-13

Suzanne Tylco from Transport Canada presented an update of TC goals and activities on frontal and side impacts. They tested in full scale tests rear facing and forward seats. For forward facing seats they utilized convertible seats and booster seats with TT used in all cases. They calculated loads acting on Latch from the dummy chest acceleration (HIII 6y + CRS 32,5 kg) with a result of 7 kN on each latch bar, and this was from full frontal tests carried out at 40, 48 and 56 km/h. Suzanne Tylco summarized TC work on side impact. It covers Q3S evaluation in barrier or car to car tests. The main objectives being:

To have a more realistic representation of interactions in vehicle during side impact test (to take account interactions between occupants, CRS, door panel, etc.), i.e. the test is to be based of a 50 km/h – 90° car to car impact.

To have a worse case regarding excursion

PC asked if intrusion speed can be measured / determined in car to car tests. The answer was that tracking the internal panel during such a test is a difficult task.

5.4 Dummies

5.4.1 FTSS presentation on Q series dummies

Doc. INF_GR / CRS-3-14

The Q series family development began in 1993. Between 1997 and 2001, FTSS worked with members of a European program CREST to develop the Q3 that is used now (with some mechanical modifications in the last years to improve among others issues the durability).

FTSS is now in position to propose a complete family (Q0 to Q6), with the exception of Q10 which could be developed in a new future, due to participation of FTTS in a new program with financial support to work on it.

Current dummies are developed to offer measurements in frontal impact tests. For side impact, FTSS developed a version “s” (Q3s) which is in evaluation at Transport Canada and NHTSA. The Q3s will be followed by a Q6s.

The group noted that the communication around the different series, the modifications on the dummies, and the version available in the laboratories, even for the owners are not clear.

Moreover the group noted that during presentation, FTSS used comparative results between CRS tested with P and Q series (EEVC Working Group 12 and 18 works). The conclusions showed, based on HIC criteria, that most of existing CRSs will not meet the new criteria, which are yet to be validated by EEVC Steering Committee. Some comments in FTSS document were changed after the discussion to take into account present CRS performance.

5.4.2 NPACS dummies experience by DFT, NPACS, laboratories

Doc. INF_GR / CRS-3-15

Marianne Le Claire presented data from NPACS regarding comparison of dummies, including P3, “old” Q3, Q3 new generation, 3 years old Hybrid III (international draft ISO DIS14646). Conclusions are available on document which is now on UN ECE website.

Following the presentation Pierre Castaing request a clear position on Q family. He would like to have a summary with the exact capacities of available Q series dummies.

Mister Waagmeester, from FTSS, replied that all the Q series dummies on the European market are upgraded between 2003 and 2004. This upgrade concerned “standard Q series family” (frontal used).

The Qs series dummies are evolution and not currently available. Assessments of these dummies are in progress in US and Canada. Conclusions could be available sooner (presentation of Marie Versailles from NHTSA in the future GRSP meeting – **Doc. GRSP INF - 43.17**).

At present in Europe laboratories use “standard” Q series dummies in their experimental or consumer side impact tests.

5.5 Dynamic tests

5.5.1 Side test protocol

5.5.1.1 ISO Presentation CD 29062 and update

This study is included in Farid Bendjellal’s presentation, see item 5.5.1.2.

5.5.1.2 CLEPA presentation

Doc. INF_GR / CRS-3-16

Farid Bendjellal presented to the group a status of existing side impact protocols used for CRS testing/approval.

- Australian standard AS/NZ 1754 (2004)
- ISO standard from 2008 CD 29062
- NHTSA research
- Britax/ADAC protocol
- ADAC/Stiftung Warentest procedure

This presentation, which is on the UN ECE website, provides information on current used protocols.

5.5.2 NPACS study on rear impact

This presentation is postponed next meeting for lack of time

5.5.3 UTAC presentation on pulses

This presentation is postponed next meeting for lack of time

5.6 Interoperability with vehicles

5.6.1 APROSYS presentation by UPM

This presentation is postponed next meeting for lack of time

6 Date and Venue of Next Meetings

Dates of next meetings were planned:

- June, 18th – CCFA (Paris)
- September, 2nd – BASt (Köln) or FAIR (Vienna)
- October, 7th – CLEPA (Brussels)
- November, 25th – BNA (Surennes)

7 AOB

No other business.

8 Actions

See Action list in Annex 2.

9 Attachments and Working Documents

Annex No.	Presented by / on behalf of	Title
1	PC	Attendance list
2	PC	Actions list
3	PC	Documents list

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Group Secretary
26 May 2008

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Action Number	Action	Target Date	Action By	Comp Date
1.1	~~Terms of reference~~	~~01/04/08~~	~~Chairman~~	~~01/04/08~~
1.2	Test Bench definition – Information/Presentation following NPACS protocol	13/05/08	OICA / CI	13/05/08
1.3	R point / Cr point correlation	Postponed 13/05/08	MPA	13/05/08
1.4	Floor positioning versus R (H) point	Postponed 13/05/08	OICA	13/05/08
1.5	~~Classification - Anthropometry data~~	~~01/04/08~~	~~CLEPA~~	~~01/04/08~~
1.6	Classification – Load level in Isofix anchorages	Postponed 13/05/08	OICA / CLEPA	13/05/08
1.7	Dummies – FTSS presentation	13/05/08	RDW / EEVC WG12	13/05/08
1.8	Dummies – Results from test labs	13/05/08	All	
1.9	Dummies – NPACS experience	13/05/08	CI	13/05/08
1.10	Dummies – DFT Validation	13/05/08	DFT	13/05/08
1.11	Side Test protocols in the world	13/05/08	CLEPA	13/05/08
1.12	Validation of door velocity in side impact procedure		OICA	
1.13	APROSYS study on vehicle's interior arrangement		UPM	
1.14	Misuses – Marking of Isofix anchorages	ASAP	TUV Rheinland	
1.15	Information to GRSP concerning CRS regulation for Buses and Coaches		IDIADA	
1.16	Pulses – Presentations/Analysis	Postponed 18/06/08	UTAC	
1.17	ISO data on accidentology and accident scenario	Postponed 13/05/08	ISO	13/05/08
1.18	~~EEVC WG18 final report~~	~~01/04/08~~	~~EEVC WG18~~	~~01/04/08~~
1.19	~~Invitation of EEVC WG12, WG18 and TUB~~	~~01/04/08~~	~~Secretary~~	~~01/04/08~~
2.01	EEVC WG18 final report (version of February 07)	18/06/08	Netherlands	

Action Number	Action	Target Date	Action By	Comp Date
2.02	NPACS study on rear impact	Postponed 18/06/08	TRL	
2.03	US situation on rear impact	Postponed 18/06/08	Chairman	
2.04	Side impact data upgraded	Postponed 18/06/08	LAB	
2.05	Dummy family comparisons by NPACS	13/05/08	TRL	13/05/08
3.01	Comparison between ECE.R44 and NPCAS test bench	18/06/08	TRL	
3.02	Information on acceptable limits of vehicle floor	18/06/08	All	

Document Number	Title	Origin
INF GR / CRS-3-18	Minutes of 3rd meeting of the Informal Group on Child Restraint System	Secretary
INF GR / CRS-3-17	Load level in Isofix Anchorages	CLEPA
INF GR / CRS-3-16	Side Impact Test Methods for Evaluating Child Restraint Systems. A Summary for GRSP Informal Group on Child Restraints Systems	CLEPA
INF GR / CRS-3-15	Dummies NPACS comparison	TRL
INF GR / CRS-3-14	Q-dummies ready to enter regulations	FTSS
INF GR / CRS-3-13	Child Occupant Protection Research &Considerations for Future Regulations	Canada
INF GR / CRS-3-12	JPMA/Vehicle Manufacturer LATCH WG	US
INF GR / CRS-3-11	Classification - Anthropometry	CLEPA
INF GR / CRS-3-10	Data from child anthropometry data base CANDAT	Netherlands
INF GR / CRS-3-9	Selection of Size of Child Restraints	Australia
INF GR / CRS-3-8	Indicative Anthropometric Data	Australia
INF GR / CRS-3-7	Data on floor position	OICA
INF GR / CRS-3-6	Location of ISOFIX Top-tether anchorages Location of Cr-Point	OICA
INF GR / CRS-3-5	NPACS presentation	TRL
INF GR / CRS-3-4	ISO information on CRS International Standards	ISO
INF GR / CRS-3-3	SMMT directions	SMMT
INF GR / CRS-3-2	ISO/TR 14646 - Road vehicles - Side impact testing of child restraints systems	ISO
INF GR / CRS-3-1	Provisional Agenda for 3rd meeting of the Informal Group on Child Restraint System	Chairman
INF GR / CRS-2-8	Minutes of 2nd meeting of the Informal Group on Child Restraint System	Secretary

INF GR / CRS-2-7	NPACS Final Report_Project Report Version2.pdf	TRL
INF GR / CRS-2-6	WHO_Growth.ppt – Anthropometric data	UPM
INF GR / CRS-2-5	05-0157-O.pdf – ESV presentation	EEVC WG18
INF GR / CRS-2-4	CANDAT_data.pdf – Anthropometric data	Netherlands
INF GR / CRS-2-3	EEVC WG18 report	Netherlands
INF GR / CRS-2-2	Proposal for Terms of Reference and Rules of Procedure	Chairman
INF GR / CRS-2-1	Provisional Agenda for 2nd meeting of the Informal Group on Child Restraint System	Chairman
INF GR / CRS-1-8	Minutes of 1st meeting of the Informal Group on Child Restraint System	Secretary
INF GR / CRS-1-7	Informal document No.GRSP-42-27	GRSP
INF GR / CRS-1-6	Informal document No.GRSP-42-02	GRSP
INF GR / CRS-1-5	Proposed Schedule for a Review of ECE Regulation 44.03	EEVC WG18
INF GR / CRS-1-4	Effect of Q-dummies and Criteria on the EEVC Test Database Results	EEVC WG12&18
INF GR / CRS-1-3	Injury Criteria for Q Dummies	EEVC WG12&18
INF GR / CRS-1-2	DRAFT OF Q-DUMMIES INJURY CRITERIA	EEVC WG12
INF GR / CRS-1-1	Provisional Agenda for 1st meeting of the Informal Group on Child Restraint System	Chairman