International Harmonized Research Activities (IHRA)

Biomechanics Working Group

Draft Minutes of Meeting held in Kyoto, Japan on May 15, 1999

Attendees:

Rolf Eppinger	Chair / USA
Dainius Dalmotas	Canada
Dominique Cesari	EU/EEVC
Jac Wismans	EU/EEVC WG12
Koshiro Ono	Japan
Toru Kiuchi	OICA Japan
Harushige Yanagisawa	Japan
Keith Seyer	Australia
Risa Scherer	WorldSID Task Group
Robert Hultman	OICA USA
Marc Beusenberg	WorldSID Project Manager
Farid Benjallal	OICA Europe
Craig Newland	Australia

Opening of Meeting:

The Chair welcomed the delegates.

At the suggestion of Jac Wismans, it was agreed that Dainius Dalmotas would be appointed as Secretary to the Working Group.

Presentations:

1. - WorldSID Update

Risa Scherer provided an update on the WorldSID project. She indicated the desire to essentially freeze the design specifications of the alpha prototype by July of 1999 and provided a brief review of the WorldSID design team and available funding. She stressed the need for input from the IHRA Biomechanics WG, in order of priority, in the following areas:

- Anthropometry, both for the 50th percentile male and 5th percentile female;
- recommendations for ATD instrumentation levels (based on accident data);
- biofidelity requirements, ranked in order of priority;
- any new biomechanical data, in useable format, which need to be considered; and
- injury risk curves, injury criteria and injury assessment reference values.

She also provided a preliminary "timeline" for the WorldSID effort **[Doc# 99-01]** as well as a preliminary of the specifications for the alpha prototype WorldSID **[Doc# 99-02]**. Marc Beusenberg noted that, in terms of IHRA input, the "sooner the better" applied in general but was particularly true for input on anthropometry.

2.- Anthropometry

Craig Newland provided a presentation of efforts to date to review available anthropometry data **[Doc# 99-03]** . He concluded with the general observation that the Jurgens report, although now somewhat dated, still provided the most up-to-date data. The presentation was followed by a lengthy discussion among delegates as to whether the data was sufficient, the relevance of the data to seated height and the impact of recent growth trends. It was agreed to further investigate whether separate male/female breakdowns could be obtained from the Jurgens data **[Action: Australian Delegates]**, as well as to investigate what improvements in defining the 50th male and 5th female specifications could be made taking into consideration the UMTRI study data as well as individual regional RAMSIS databases **[Action: Individual Delegates]**. Jac Wismans indicated that he was unsure whether TNO had access to all three regional RAMSIS databases, but that he would see what further information could be gained from at least the European (German) RAMSIS database **[Action: Jac Wismans]**.

3.- Field Accident Data

Dainius Dalmotas summarized the results of his review of side impact field accident **[Doc# 99-04]** based on the studies and data submitted to date by the various IHRA delegates. He noted that there was generally good agreement between various studies in terms of both the nature and magnitude of the side impact problem in the various

regions/countries represented within the IHRA Biomechanics WG. Some of the more specific observations made included:

- Side impacts are the second most frequent leading cause of fatal injury following frontal impacts (in Canada the reverse may be already true);
- "Near" side impacts account for 60-70% of side impact fatalities;
- Males, particularly younger males, are over-represented in fatal single vehicle collisions;
- Females now account for the majority of side vehicle-to-vehicle casualties in most jurisdictions/countries;
- Single vehicle impacts with narrow fixed objects account for significant portion of the side impact problem in all jurisdictions/countries;
- Head injuries from "far" side account for significant portion of the side impact problem in all jurisdictions/countries;
- The head and the chest represent the two most frequently injured body regions, followed by the abdomen, the pelvis and the lower extremities (importance varies with jurisdiction); and
- in North America, at least, impacts where the striking vehicle is a multi-purpose passenger vehicle (MPV) represent a very significant emerging side impact issue (in Canada, for example, they currently account for 60% of vehicle-to-vehicle side impact car fatalities).

4.- Bimechanical Data

Rolf Eppinger summarized NHTSA's current thinking regarding how best to establish biofidelity requirements for crash test dummies. A report **[Doc# 99-05]** summarizing not yet published cadaver responses recently measured in padded and unpadded sled tests was provided to the Working Group (processed data and video clip also provided on an ccompanying cd-rom). He noted that additional sled tests in the near future were plan and he would welcome any thoughts or comments from the delegates on what test conditions should be added next (eg- oblique tests, abdominal or thoracic lead, etc). He also indicated that NHTSA is currently preparing a report summarizing and prioritizing ATD response requirements for side impact dummies (including a review of ISO requirements as defined in TR9790) and anticipated that this report would be made available to the IHRA within the next two to three months.

Jac Wismans summarized developments in Europe to generate more up to date dummy response requirements under the SID-2000 project. A draft report has been generated and forwarded to EEVC WG12. He anticipated that a copy of this report could be released to the IHRA in a matter of weeks. He also indicated that the EEVC WG12 had forwarded to NHTSA its comments on NHTSA's review of ISO TR9790 **[Doc# 99-06]**. A separate document **[Doc# 99-07]** containing comments on the biofidelity rating scheme employed in ISO TR9790 had also been generated by EEVC WG12. Copies of both documents

were distributed. Jac Wismans expressed his belief that it would be useful if the IHRA Biomechanics WG deveolped its own ranking scheme. He volunteered to help assist in compiling the available ATD response data for such an evaluation by the IHRA.

5.- Injury Criteria Review

Dominique Cesari provided a verbal only presentation of available injury criteria and injury risk curves as a function of body region. He observed that the amount of data available to support meaningful assessments of injury risk in side impacts varied greatly with body region. He welcomed any contributions delegates would be willing to provide to him to assist in the completion of his written review. Consideration will be given to the ISO Working Group 6 output.

6.- TNO Q3 vs 3-Year Old Hybrid III ATD Comparison

The Japanese delegation presented a review of efforts in Japan to evaluate available three-year old child dummies, specifically the TNO Q3 dummy and the 3-year old Hybrid III dummy developed by FTSS. The study presented was recently completed jointly by the Japanese Automobile Manufacturers Association and the Japan Automobile Research Institute. The study observed that the responses generated by the two three year old dummies differed markedly under nominally identical test conditions. Dainius Dalmotas noted that similar differences in dummy response trends were also observed in tests recently completed by Transport Canada in out-of-position side airbag tests with the Q3 and the 3-year old Hybrid III dummies. The Japanese delegates distributed a draft copy of the JAMA/JARI study **[Doc# 99-08]** to the IHRA Biomechanics WG for further review and comment.

Next Meeting(s)

It is anticipated that the next meeting of the WG would be held in Germany on or about July12, 1999, followed by further meetings in Lyon on or about September 27-28, 1999 and in San Diego on or about October 28, 1999.

Close of Meeting

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List of Documents

All delegates are reminded that any documents previously tabled should be resubmitted to the Secretary so that they can be filed and numbered.