

**Informal Working Group Meeting for Side Impact – WorldSID Dummy  
2<sup>nd</sup> Meeting  
JASIC Offices, Tokyo, Japan, February 4, 2010**

## **Draft Summary Report**

### **1. Welcome and Introductions**

The chairperson, Mrs. Susan Meyerson, opened the meeting and welcomed everyone. Informal group delegates and representatives were introduced.

### **2. Approval of Agenda**

The agenda was adopted with minor changes

### **3. Review of November 2009 Meeting Minutes**

A brief summary of the November 4, 2009 meeting in Washington, D.C was given. A draft of the meeting minutes was distributed via e-mail prior to the meeting. Any comments and corrections are to be sent to Mr. Ridella or Mrs. Meyerson.

### **4. Discussions**

#### **4.1. Status of WorldSID 50<sup>th</sup> Male and 5<sup>th</sup> Female ATDs, NHTSA - B. Donnelly (WS-2-1)**

A review of the NHTSA evaluation status of the WorldSID 50<sup>th</sup> adult male dummy was presented. The evaluation is nearly complete except for final drawing preparation and an open source specification for onboard data acquisition systems. Also, additional certification data is always welcome, i.e., more data for establishing certification requirements is good. At this time there is no urgency for NHTSA to complete these work items because they prefer to have both the 50<sup>th</sup> adult and 5<sup>th</sup> small adult dummies ready for FMVSS Part 572 simultaneously. Since the 5<sup>th</sup> evaluation is just beginning, the final work on the 50<sup>th</sup> dummy can proceed when it is convenient.

Final drawing preparation – NHTSA requires drawings for Part 572 not to have any vendor names, part numbers or product specific descriptions included. The ISO WorldSID group has indicated that they will modify then 50<sup>th</sup> male drawings accordingly in collaboration with NHTSA. Until the on-board data acquisition specification effort is complete, the drawings cannot be finalized.

Onboard Data Acquisition specification-as discussed above, a specified vendor cannot be used in drawings for Part 572 and a generic open source specification is required. An ISO WorldSID meeting was held in Fall 2009, in which an approach to resolving this issue was developed in collaboration with NHTSA personnel. Areas within the dummy envelope will be identified as “gray space” where data acquisition components can be located. These spaces will be similar to existing space used by the DTS components, but will be enlarged to the extent possible. Any data acquisition supplier can utilize this gray space for their equipment, but they cannot change the regional and overall mass properties of the dummy more than a given tolerance. That tolerance will be determined through an analytical modeling effort. This effort is not yet defined and collaborators to help with this work are sought by NHSTA.

#### **4.2. WorldSID 50<sup>th</sup> and 5<sup>th</sup> Update, FTSS - J. Wang (WS-2-2)**

A status update for the WorldSID 5<sup>th</sup> female was presented. A list of additional tests performed at Autoliv was presented. Autoliv will share the results of these tests when analysis is completed. A 2D IRTRACC is now available for this dummy and a rib ballast clamp has been developed. There has been a lower leg update which is called the replacement leg. NHTSA has two 5<sup>th</sup> dummies on order and the first one will have the Phase II (or revised) leg to be replaced later and the second one will have the

replacement leg. The first dummy will be delivered on or about February 15<sup>th</sup> and the second one on or about April 23<sup>rd</sup>.

There was discussion about the various incarnations of the dummy and it was agreed that there was an original dummy, a revised dummy also called Phase II and now a replacement leg. The APROSYS work was done with both the original and revised dummies.

There was discussion about the need for additional plantar flexion range-of-motion for the foot and Dr. Wang indicated that FTSS would make the necessary revisions but he was uncertain how long that might take to complete and that it might affect when the NHSTA dummies receive the replacement legs.

There was a discussion about using the 2D IRTRACC instead of the 1D because the 2D version corrects for oblique loading by measuring and using the angle which the IRTRACC makes with the spine. It was indicated that the RibEye deflection measurement system, currently in one 50<sup>th</sup> male WorldSID, could be used to determine how the IRTRACC data could be used. It was agreed that is important and a research sub-group would be started under this informal dummy group to investigate this issue.

It was determined that there is no agreement on a seating procedure for the WorldSID in the rear seat. A procedure will need to be formalized. The ISO group is working on it but more work needs to be done. It is estimated to take another year to finish.

#### **4.3. Biofidelity Tests for WorldSID 5<sup>th</sup> Female – EEVC, J. Jensen (WS-2-3)**

A presentation was made reviewing the ISO WorldSID Group biofidelity rating process and APROSYS 5<sup>th</sup> evaluation project. Mr. Jensen complimented the APROSYS work. The existing tests included in the biofidelity study as specified in the ISO 9790 procedure were reviewed and it was noted that some are being deleted and others are being added. For the WorldSID 5<sup>th</sup> dummy, it was noted that the drop tests have not been done, because a testing organization has not yet been identified to conduct the testing. Additionally for impactor tests, the WorldSID seat should not be used and the dummy should be seated upright. Also, it was noted that the spherical impactor face should be used for pelvis tests. It is not clear which version of the dummy was used for the neck testing in the APROSYS tests. For sled testing, no foam supports should be used because they affect the dummy response as compared to the PMHS response. Mr. Jensen suggested that the prototype WorldSID 5<sup>th</sup> should not be used for either biofidelity or injury risk curve development. It is expected that the new ISO 9790 tests should be completed soon, but an exact date could not be specified.

There was a question on whether oblique tests would be conducted and it was noted that currently there are no oblique thoracic tests in the ISO procedure. Mr. Jensen agreed this was important, but ISO 9790 requirements should be the priority.

It was recommended that there be detailed descriptions of the test conditions that are being performed such that others can be sure of what exactly is being measured so that there is no confusion or uncertainty with the results. Similarly, the data processing should be clearly described. It was stated that the collaboration on the WorldSID 50<sup>th</sup>, under the auspices of the ISO WorldSID Group, has been excellent and that it should be the model for the 5<sup>th</sup> evaluation. This statement met with general agreement.

There was discussion on the dummy revision status and the need to be clear as to what version is being tested and a similar discussion on the “MCW” testing and whether the wall will be scaled to the 5<sup>th</sup> anthropometry. General opinion seems to be that it should be scaled; however, it was stated that data should be reported as measured and not normalized. There are 7 known WorldSID 5<sup>th</sup> females and it was recommended that all of these dummies be at the same revision level if they are to be used for testing.

The dummies are: 2 – NHTSA (new), 2 – Transport Canada (one upgraded), 2 – FTSS (both upgraded), and 1 – Ford (not upgraded).

It was agreed by all that the WorldSID 5<sup>th</sup> data evaluation should take place under the ISO WorldSID Group following on the success of the WorldSID 50<sup>th</sup> effort. The ISO WorldSID Group will report regularly to the working group.

#### **4.4. Status of WorldSID 50<sup>th</sup> Male and 5<sup>th</sup> Female ATDs, NHTSA - B. Donnelly (WS-2-1)**

A presentation was made on the NHTSA view of the WorldSID 5<sup>th</sup> female dummy development and evaluation status. The APROSYS work was again reviewed and Dr. Donnelly noted the importance of this study which took on the 5<sup>th</sup> evaluation at a very early stage in development. NHTSA would like to use the APROSYS data as the starting point in an evaluation study and requests access to the data and reports. It was agreed that the ISO WorldSID group could set-up a data archival site to provide access to the 5<sup>th</sup> female dummy test data, as it becomes available, similar to the service provided for the 50<sup>th</sup> male. The ISO WorldSID Group could also provide a data review and quality control function through detailed data review sessions, as it did for the 50<sup>th</sup>.

FTSS agreed to loan the WorldSID 5<sup>th</sup> drawings to NHTSA in to facilitate their inspection of the dummies being delivered to NHTSA in the near future.

#### **4.5. JAMA/JARI Evaluation Tests of the WorldSID 5<sup>th</sup> Dummy, JAMA – A. Akiyama (WS-2-4)**

JAMA presented the results of their evaluation efforts for the WorldSID 50<sup>th</sup> male and the 5<sup>th</sup> female dummies. Akiyama-san reviewed the organizing structure through the ISO WorldSID Group, presented the history of the 50<sup>th</sup> effort and presented the JAMA results for the 5<sup>th</sup> dummy. This work was completed in 2008-2009 and included shoulder and thoracic impact data. The results were quite good. Results from one FMVSS 214-type full-scale test were also presented. Some differences were noted between the WorldSID 5<sup>th</sup> and SID IIs response in the test, however the WorldSID 5<sup>th</sup> was judged to be quite good as compared to the SID IIs. It was indicated that the dummies were equipped with 1D IRTRACC versus 2D. JAMA will have further discussions on whether they will be able to conduct more testing using the 5<sup>th</sup> female, if one becomes available.

#### **4.6. Injury Risk Criteria for WorldSID 50<sup>th</sup> Male – A. Petitjean (WS-2-6)**

Ms. Audrey Petitjean spoke by telephone describing the ISO injury criteria report for the 50<sup>th</sup> male dummy, Technical Report 12350. Ms. Petitjean announced a web meeting on WorldSID injury risk development on February 11<sup>th</sup> at 1:00 pm Europe Standard time and all were invited to participate. The purpose of the meeting was to review the ISO Technical Report and to discuss the various injury prediction methodologies and how to proceed. It is expected that this ISO injury criteria group will meet at least two times before the ISO Spring meeting. Ms. Petitjean expects to continue her work on injury criteria on the 5<sup>th</sup> female dummy, but will need the 5<sup>th</sup> female biofidelity data to begin work on the injury criteria for the 5<sup>th</sup> female dummy.

#### **4.7. Timelines and Current Activities**

A lengthy discussion took place outlining tasks and timelines. A draft spreadsheet of the resulting schedule is posted (WS-2-5).

ISO indicated a strong intent to continue to support the WorldSID effort. Their industry members should participate. ISO would be the lead organization on biofidelity. This will be discussed at their Spring 2010 meeting in Milan, Italy.

The Netherlands indicated that the EEVC will consider the task list and schedule and discuss with their Steering Committee whether to participate and how much to participate. They will get back to the group.

The European Commission expects to have funding and it is likely that they will be able to support this effort. The EC is open to suggestions on the scope of projects that could be funded. They will get back to the group.

Japan stated that JAMA is the organization in Japan that would participate in this effort and since they are a member of OICA they cannot commit at this time.

PDB will support the effort through the mass parameter modeling. PDB has a new WorldSID FE model that should be ideal for that task.

The UK indicated that they will do one additional crash test with the 50<sup>th</sup> dummy and they will share the data once the report is released.

NHTSA will create a list of typical durability tests that they do for dummy evaluations.

#### **4.8. Dummy Drawings & Documents**

The UK made the point that there exists a serious issue with ownership of the drawings for the WorldSID 5<sup>th</sup> dummy. They are owned by FTSS unlike the 50<sup>th</sup> drawings, which are publicly available. It was noted that if the drawings are not made public, then NHTSA cannot regulate the dummy. If that were to happen then all investment by the governments and organizations in this dummy would be effectively wasted. He indicated that members of the group are very concerned about this possibility and would like to see the situation resolved.

FTSS indicates that a User's Manual exists and they will make it available to the group. NHTSA will produce the PADI (Procedures for Assembly, Disassembly and Inspection) because it is a requirement for part 572. The PADI will be written after the evaluation work is done.

#### **4.9. 5<sup>th</sup> Female Onboard Data Acquisition Specifications**

It is generally agreed that the mass study for the 50<sup>th</sup> male will serve for the 5<sup>th</sup> female. It was suggested to start with the 5<sup>th</sup> and the result should be applicable to the larger 50<sup>th</sup> male. It was noted that there is no 5<sup>th</sup> model. PDB and NHTSA will work together on a mass properties study.

### **5. Next Meetings**

- April 12, 2010 (7am EST) – Detroit and WebEx  
It will be in conjunction with the SAE World Congress.
- September 22, 2010 – Germany (?)  
Is tentatively scheduled for the week after IRCOBI and is in conjunction with the GTR 7 Phase 2 meeting.

### **6. Task List from Meeting**

- All – Please provide any certification available to the group to help in establishing certification requirements. (4.1)
- FTSS/Autoliv - Share the results of 5<sup>th</sup> female tests when analysis is completed. (4.2)
- NHTSA - to start a research sub-group on dummy thoracic displacement instrumentation to include IRTRACC and RibEye systems. (4.2)
- ISO – Formalize a seating procedure for the WorldSID in the rear seat. (4.2)
- Transport Canada - Will request of the ISO WorldSID Group that they coordinate a collaborative evaluation process of the WorldSID 5<sup>th</sup> Dummy to review data and provide a data archival function through the ISO website, in collaboration with FTSS. (4.3)

- FTSS to provide NHTSA with a set of the WorldSID 5<sup>th</sup> drawings, on loan, for an inspection of the new NHTSA dummies. (4.4)
- NHTSA will develop a list of typical durability tests done at VRTC during a dummy evaluation project and to share it with the group. (4.7)
- FTSS to make the WorldSID 5<sup>th</sup> User's Manual available to the group. (4.8)

## 7. Attendees:

Susan Meyerson (Chair)	USA/NHTSA
Stephen Ridella	USA/NHTSA
Bruce Donnelly	USA/NHTSA
Bernie Frost	UK/DfT
David Hynd	EEVC/TRL
Hans Ammerlaan	Netherlands/RDW
Allan Jonas	Australia
Peter Broertjes	EC
Z. Jerry Wang	FTSS
Bachar Aljundi	FTSS
Yuji Okuda	FTSS
Naoki Kiuchi	FTSS
Takuya Iwamura	FTSS
Masato Iwaoka	FIT Pacific
Teruo Sawada	FIT Pacific
Klaus Bortenschlager	PDB
Markus Hartlieb	PDB
Philipp Wernicke	PDB
Paul Depinet	Denton
Mike Beebe	Denton
Takeshi Korenori	Japan/MLIT
Kiyohiko Hirakawa	Japan/MLIT
Hideki Yonezawa	Japan/NTSEL
Koshiro Ono	Japan/JARI
Hiroyuki Asada	JASIC
Yoshihisa Tsuburai	JASIC
Jack Jensen	General Motors
Vinayak Gogate	Tata Motors
Suzanne Tytko	Transport Canada
Bernd Lorenz	Germany/BASt
Ansgar Pott	OICA/Hyundai Motor Europe
Keiji Hatano	Nissan
Akihiko Akiyama	Honda
Mitsutoshi Masuda	Toyota
Akira Kanatani	Toyota
Gerry Locke	Lear Corp
Julien Estavoyer	PSA-Peugeot Citroen
Takeshi Harigae	Japan/JARI
Alain Bussieres	Transport Canada/PMG
Audrey Petitjean	CEESAR/France