Status of WorldSID
50th Male and 5th Female ATDs

1st Informal WorldSID Working Group Meeting
Tokyo, Japan
4 February 2010

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Bruce R. Donnelly, Ph.D.

National Highway Traffic Safety Administration
Vehicle Research and Test Center
WorldSID 50th Male
# Federalization Matrix

## Operation

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Dummy Inspection</th>
<th>Component Testing</th>
<th>Sled Testing</th>
<th>Crash Testing</th>
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## Time

[WS--2-1](#)
NHTSA Federalization

- Drawing Package
- Certification (additional data is desirable)
- Durability
- R&R
- Biofidelity
- PADI (Procedures for Assembly, Disassembly and Inspection)
Possible Collaboration Work

- **Drawing Package**
  - Physical dimensions
  - Weight and CG of segments
  - Must be freely available to public without restrictions
  - Must not endorse any manufacturer

- **Onboard DAS part 572 specification**
  - specify these parameters by body region:
    - Use CAD to determine
      - Mass, CG location, MMI
      - Space (volume) where DAS can be mounted
  - Electronic performance requirements
  - Define acceptable tolerances based on simulations
    - Madymo parameter study
Thank You
Questions?
WorldSID 5\textsuperscript{th} Female
5th Female Evaluation

- NHTSA is purchasing a second WorldSID 5th small adult dummy

- Initiate Standard Evaluation
  - Inspection/Drawing Package
  - Certification
  - Durability
  - Repeatability & Reproducibility
  - Biofidelity
  - User’s Manual (PADI)
## 5th Female Evaluation

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### Time

- **NHTSA Work**
- **Collaboration Work**
5th Female Evaluation

- APROSYS Work
  - Anthropometry
  - Biofidelity
  - Certification
  - Injury Risk Functions

- ISO Biofidelity Ranking = 7.6/10

- NHTSA Biofidelity Rank = ?
5th Female Evaluation

- **Biofidelity**
  - APROSYS conducted extensive testing of ISO 9790 conditions
    - Share reports and data
    - NHTSA conduct BioRank analysis
  - APROSYS conducted Yoganandan tests
    - Share reports and data
  - **BioRank**
    - Not clear which dataset was used in the APROSYS analysis
    - Revision 1 generally scored worse than the prototype
5th Female Evaluation

- **Repeatability**
  - APROSYS summary is brief, slightly vague, and qualitative
  - Provide summary reports and data
    - AP-SP52-0043 *Prototype Evaluation: Biofidelity, Sensitivity, and Durability Test Results*
    - AP-SP52-0058 *Updated Prototype Dummy Fully Operational for Testing According Recommendations of D5.2.3*
  - No reproducibility evaluation
5th Female Evaluation

- **Durability**
  - Durability is selective and somewhat qualitative
  - BASt
    - Tracked rib deformation over 15 sled tests; in general there was less than 2 – 3 mm of permanent deformation
    - Reported issues with IR-Tracc ball joint
  - TRL
    - Debonding of thorax rib 2
    - Shoulder rib permanent deformation (amount?)
  - FTSS
    - Observed rib debonding after UPM-INSIA testing
  - Recurring problem: retention of shoulder ball joint in shoulder bracket
Other Items

- Certification
  - APROSYS published draft procedures and corridors
  - NHTSA can use these as a starting point for evaluation
- User’s Manual
- Status of recommended changes to optimize neck response
List of References Needed

<table>
<thead>
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<th>Report #</th>
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<td>AP-SP52-xxxx</td>
<td><strong>0036</strong> Biofidelity Testing of the 5th Female WorldSID Head-Neck Response</td>
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<td>D5.2.9 Appendix BAS (Maltese corridors scaled by Yoganandan)</td>
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## WorldSID Project Timing

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- Biofidelity
- R & R
- Durability
- PADI
- DAS Specs
- Drawing Package
- Part 572 NPRM

### 5th Female
- Receive Dummy
- Inspection
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Thank You
Questions?