Injury Risk Curves for WorldSID 50th Male

GRSP Informal Meeting February 4, 2010

ISO TC22/SC12/WG6 Task Group

- Performed detailed data quality check of existing PMHS side impact test data
- Scaled the test severity from PMHS size to mid-size male
- Scaled WorldSID test data to the same test severity as the PMHS
- Adjusted WorldSID test data from PMHS age to 45
- Paired WorldSID measures with PMHS injuries

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- Developed injury risk curves using the following methods:
 - Certainty
 - Mertz-Weber (Modified Median Rank)
 - Survival
 - Logistic
 - CTE
- Reference: Petitjean, et al. (2009) 53rd Stapp

WorldSID 50th Injury Risk Curves Were Developed for:

- AIS ≥ 2 Shoulder Injury as Functions of:
 - Shoulder Rib Deflection
 - Shoulder Force F_v
- AIS ≥ 3 Thoracic Skeletal Injury as Functions of:
 - Thorax Rib or Abdomen Rib Deflection
 - Thorax Rib or Abdomen Rib V*C
- AIS ≥ 4 Thoracic Skeletal Injury as Functions of:
 - Thorax Rib or Abdomen Rib Deflection
 - Thorax Rib or Abdomen Rib V*C

WorldSID 50th Injury Risk Curves Were Developed for:

- AIS ≥ 2 Abdomen Injury as Functions of:
 - Abdomen Rib Deflection
 - Abdomen Rib V*C
 - Lower Spine Acceleration (3 ms clip)
- AIS ≥ 3 Abdomen Injury as Functions of:
 - Abdomen Rib Deflection
 - Abdomen Rib V*C
 - Lower Spine Acceleration (3 ms clip)

WorldSID 50th Injury Risk Curves Were Developed for:

- AIS ≥ 2 Pelvis Injury as Functions of:
 - Pubic Force
 - Pelvis Acceleration (3 ms clip)
- AIS ≥ 3 Pelvis Injury as Functions of:
 - Pubic Force
 - Pelvis Acceleration (3 ms clip)

Continuing Work of ISO TC22/SC12/WG6

- Technical Report on Injury Risk Curves for WorldSID 50th is being balloted at SC level
- Task Group is being formed to reach consensus on appropriate statistical methods to be used

Additional Efforts to Consider

- Form a group of Technical Experts from GRSP Informal Group to:
 - Review work of ISO WG6 task group
 - Propose and review other methods
 - Reach agreement among technical experts
 - Develop a plan to conduct tests and generate risk curves for head and neck injuries

Additional Work to Consider

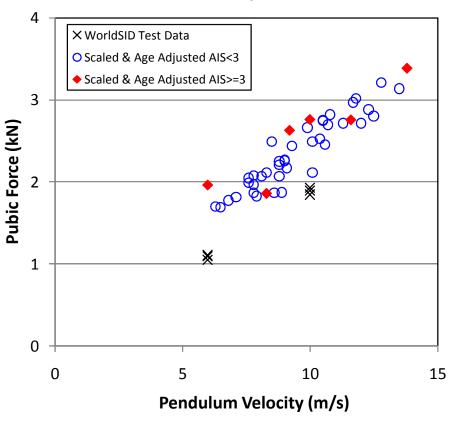
- Review the PMHS test conditions that had sufficient data quality to be considered, but no WorldSID 50th tests were conducted
 - Conduct new WorldSID 50th tests that, when paired with PMHS injuries, would achieve a better balance between injured and un-injured for risk curve development

Additional Work to Consider

- Review the velocity of WorldSID 50th tests and the velocity scaled from PMHS tests
 - Conduct new WorldSID 50th tests at velocities that correspond to
 - Lowest velocity scaled from non-injured PMHS
 - Highest velocity scaled from non-injured PMHS
 - Lowest velocity scaled from injured PMHS
 - Highest velocity scaled from injured PMHS
 - Is WorldSID linear across velocity range?

Example Where Data May Have Been Extrapolated Beyond Linear Range of WorldSID

WorldSID 50th Pelvis Pendulum Impact Pendulum Velocity vs. Pubic Force



- X WorldSID pelvis testsconducted at 6 & 10 m/s
- 40% of "non-injured" data was paired with WorldSID data extrapolated beyond 10 m/s
- 33% of "injured" data was paired with WorldSID data extrapolated beyond 10 m/s

ISO TC22/SC12/WG6 Task Group on Statistical Methods

- First web meeting of WG6 Task Group will occur February 11, 2010 at 1PM (Paris time)
- All experts are invited to participate
- Please e-mail Audrey.Petitjean@ceesar.asso.fr