

IHRA Side Impact Working Group Status Report GRSP, December 2001

What is IHRA?

- International Harmonised Research Activities formed at 15th ESV in Melbourne during 1996
- International government steering committee
- 6 Working Groups to coordinate research in 6 major problem areas of road safety

What is IHRA?

- Vehicle Compatibility (UK/EEVC)
- Advanced Offset Frontal (Italy, EEVC)
- Biomechanics (NHTSA/USA)
- Pedestrian Safety (JMoT, Japan)
- Intelligent Transport Systems (Transport Canada)
- Functional Equivalence (USA/ Australia)

IHRA Side Impact Working Group

- Side Impact Working Group formed after 1998 ESV
 - to replace Functional Equivalence
 - lead country Australia
- SIWG held its first meeting in Gothenburg in September 1998.

IHRA Side Impact Working Group

- Side Impact Working Group has around 10 members
 - enhances likelihood of progress
- Governments of Europe, USA, Canada, Australia and Japan represented.
- 3 Industry experts from OICA
 - one each from North America, Europe and Asia-Pacific

SIWG - Terms of Reference

- The terms of reference of the SIWG is to co-ordinate research worldwide to support the development of future side impact test procedure(s) to maximise harmonisation with the objective of enhancing safety in real world side crashes.

SIWG - Terms of Reference

- Real world crash studies to define problem
- Protect both front and rear adult and child occupants
- Interact with IHRA Biomechanics, Offset frontal and compatibility WG
- Involved in development of WorldSID or other side impact dummy
- Examine component or sub-systems tests

Real World Crash Studies

- Vehicle-to-vehicle and vehicle to narrow object crashes - 90% side impact trauma
- Most trauma to struck side
- up to 40% trauma to non-struck side
- Head and chest most frequent
- Abdominal, pelvic and lower extremities
- Contacts - B-pillar, door, exterior object

Real World Crash Studies

- Females predominated in vehicle-to-vehicle crashes (up to 60%)
- Males predominated in vehicle-to-narrow object crashes
- Elderly over-represented in vehicle-to-vehicle crashes
- Rear occupants < 15% of side impact trauma

Interaction with Other Researchers

- Outcome of accident studies related to IHRA Biomechanics and WorldSID Task Group
- Defined what needed to be measured to guide WorldSID design
- IHRA Biomechanics to provide anthropometry, biofidelity requirements and injury criteria

Interaction with Other Researchers

- IHRA Frontal and Compatibility WGs kept informed on progress of side impact WG
- Interaction expected to become more formalised as test procedures become more crystallised
- Need to ensure that countermeasures in one area do not degrade safety in another

WorldSID

- IHRA Biomechanics provided anthropometry for 50% male
- Australia hosted workshop to launch prototype WorldSID in December 2000
 - SIWG meeting held back-to-back
- SIWG requested development of 5% female WorldSID

Proposed Test Procedures

- Accident data indicated 4-part test procedure required:
 - Mobile Deformable Barrier to vehicle test
 - Vehicle to pole test
 - Out-of-position side airbag evaluation
 - Sub-systems head impact test

Mobile Deformable Barrier Test

- Most challenging task for the group
- Injury outcome in first 40 msec
- Intrusion not good predictor of injury
- Parametric studies to examine effect of mass, stiffness & geometry on injury outcome

MDB Test - Main Issues

- Need for rear dummy?
- Crabbed or perpendicular test?
- Barrier element - homogeneous or not?
- Stiffness distribution of barrier element?
- Mass of trolley?
- Ground clearance of barrier?
- Non-struck side test?

MDB Test - Stiffness/Homogeneity

- Stiffness distribution determines intrusion profile shape
- Are current elements representative of current fleets?
- Is only initial stiffness important?
 - little crush of bullet vehicle
 - issue for compatibility

MDB Test - Kerb Mass

- European/Japanese fleet average mass of passenger cars is 1150-1200 kg
- US passenger car fleet 1415 kg
- US LTV fleet 1920 kg
- US Pass car/LTV fleet 1635 kg
- Europe may consider 1500 kg
 - US and Japan undecided

MDB Test - Ground Clearance

- US want something representative of LTVs
 - perhaps 450 mm
- Rest of world will consider 350 mm
- Perhaps 350 mm ground clearance plus mandating “blocker beams” in LTVs

MDB Test - Agreed Points

- Longitudinal impact velocity component of 50 km/h
- Small adult female driver dummy.
- Seatbelts applied

Pole Test

- Moving vehicle to pole test
- Perpendicular impact
- Impact speed 30 km/h
- Evaluate head and thorax(at least)
- Mid size male
- Rigid pole [350 mm]
 - load head and thorax simultaneously

Out-of-position side airbag evaluation

- ISO TR 14933, NHTSA and Transport Canada and IIHS research
- NHTSA and Transport Canada to review current research

Sub-Systems Head Impact Test

- Based on FMVSS 201
- Also new research from EEVC

Future of IHRA

- Future of IHRA discussed at 17th ESV
- Support for IHRA to continue
- Governments must be prepared to provide IHRA specific resources
- Governments must be prepared to develop IHRA outcomes into harmonised regulations

Future of IHRA SIWG

- Terms of Reference currently being revised to reflect progress to date and what needs to be done to complete task (copy attached)
- To include research into non-struck side injuries
- ISO to develop small female version of WorldSID
 - seeking funding

Future of IHRA SIWG

- Plan to have test procedures fully drafted in time for 18th ESV in Japan in 2003
- Plan to coordinate evaluation of these test procedures by 2005 ESV

IHRA SIDE IMPACT WORKING GROUP: NEW TERMS OF REFERENCE (2001 – 2005)

Objective

Co-ordinate research worldwide to support the development of future side impact test procedure(s) to maximise harmonisation with the objective of enhancing safety in real world side crashes.

Scope

In its first 2-year term, the Side Impact Working Group (SIWG) concluded that new test procedures to address the side impact problem should include:

- A mobile deformable barrier to vehicle test
- A vehicle to pole test
- Out of position airbag evaluation
- Sub-systems head impact test

In its next term, the SIWG will also coordinate research to examine the feasibility of improving side impact protection for occupants on the non-struck side and develop a test procedure to evaluate such protection.

Activities

The SIWG is working towards achieving these goals by:

1. Reviewing any new real world crash data to prioritise injury mechanisms and identify associated crash conditions taking into account likely future trends.
2. Taking into account the need to protect both front seat and rear seat(s) adult and child occupants.
3. Interaction with the IHRA Biomechanics Working Group to monitor the development of harmonised injury criteria.
4. Interaction with the IHRA vehicle compatibility working group to ensure solutions in one area do not degrade safety in another.
5. Monitoring and, as appropriate, providing input to the development of WorldSID and any other side impact dummy.
6. Determining the greatest degree of harmonisation feasible and the design and vehicle safety performance implications of adopting different levels of test severity or the worst case condition.
7. Coordinating the evaluation of proposed test procedures subject to availability of test dummies and injury criteria.

Timeframe

While the progress of the group will be reviewed every 2 years, it is expected that:

- The target date for draft final proposal of test procedure(s) is 2003 ESV
- The target date for final proposal of test procedure(s) is 2005 ESV.