49th GRSP Session
Status report of
Informal Group on FI

Pierre CASTAING
Chairman
Mandate of the informal group on Frontal Impact

  – 26. The Chairman of the informal group on frontal collision introduced the status report of this group (GRSP-46-26). He concluded that more time and discussion were needed to reach an agreement on the main issues indicated in the terms of reference of the group (GRSP-43-12). GRSP agreed to inform WP.29 at its March 2010 session in order to rearrange the plans of the group.

  – 37. The Chair of the informal group on frontal collision introduced the latest status report of the informal group (GRSP-47-14). He explained that the group had difficulties at this stage to deliver a draft new Regulation No. 94 yet, and suggested that the deadline of his group should be extended to May 2011 to clarify the planning of the group. GRSP endorsed the suggestion of the Chair of the informal group and agreed to inform WP.29 at its June 2010 session.

  – 34. Regarding Regulation No. 94 (Frontal collision), she asked for the extension of the mandate of the informal group until May 2011. The World Forum endorsed the request.
Figure C - 7. AIS2+ injury distribution for MAIS3+ survivors in Great Britain (left) and Germany (right)

Figure C - 8. Distribution of age and gender for car-car/LGV impacts in Great Britain (left) and Germany (right)
### 1.2. „TCA“ Generic Benefit Assessment

<table>
<thead>
<tr>
<th></th>
<th>Fatalities</th>
<th>Severely Injured</th>
<th>Slightly Injured</th>
<th>Uninjured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Now</td>
<td>100,0%</td>
<td>100,0%</td>
<td>100,0%</td>
<td>100,0%</td>
</tr>
<tr>
<td>a</td>
<td>98,2%</td>
<td>100,1%</td>
<td>100,0%</td>
<td>100,4%</td>
</tr>
<tr>
<td>b</td>
<td>95,0%</td>
<td>100,0%</td>
<td>100,7%</td>
<td>100,8%</td>
</tr>
<tr>
<td>c</td>
<td>96,1%</td>
<td>99,6%</td>
<td>100,7%</td>
<td>102,2%</td>
</tr>
<tr>
<td>d</td>
<td>93,7%</td>
<td>100,0%</td>
<td>101,3%</td>
<td>99,8%</td>
</tr>
<tr>
<td>e</td>
<td>91,8%</td>
<td>99,4%</td>
<td>102,5%</td>
<td>100,7%</td>
</tr>
<tr>
<td>b+d</td>
<td>90,6%</td>
<td>99,9%</td>
<td>102,0%</td>
<td>100,3%</td>
</tr>
<tr>
<td>e+d</td>
<td>88,6%</td>
<td>99,3%</td>
<td>103,2%</td>
<td>101,1%</td>
</tr>
<tr>
<td>f</td>
<td>68,0%</td>
<td>100,0%</td>
<td>107,8%</td>
<td>95,8%</td>
</tr>
</tbody>
</table>

- **a.** Do nothing
- **b.** Add „crashworthiness“ to small cars
- **c.** Increase „crashworthiness“ of all cars to high NCAP level
- **d.** Adjust restraint system to female
- **e.** Adjust restraint system to female and elderly occupants
- **f.** Better „crash energy distribution“
Possible scenario for amendment of ECE R94

Older
- 50th % needed
  - FHB-50%
  - THOR NT-50%
  - THORAX Input
  - DEO
  - Rib Eyes
  - THMP R
  - THOR NT-50%

Female
- 5th % needed
  - FHB-5%
  - THOR NT-5%
  - THORAX Input
  - DFO
  - Rib Eyes
  - THMP R
  - THOR NT-5%

Frontal Impact
- FIMCAR Input
  - Full Width Test
    - D WHR
    - I WHR
  - Offset Test
    - PDB
    - ODB
Possible scenario for amendment of ECE R94

Older

- 50th % needed ➞ Test configurations and seating positions TBD
- THOR NT-50% ➞ Ready for use
- THOR NT-50% ➞ First availability (end 2014)
- THORAX input ➞ Better criteria for chest deflection
- DEO ➞ Needs validation of the proposed criteria (end 2011)
- Rib Eyes ➞ Needs validation of R&R
- THIMPR ➞ Needs validation of R&R
- THOR NT 50% ➞ First availability (end 2016)

Female

- 50th % needed ➞ Test configurations and seating positions TBD
- THOR NT-5% ➞ Ready for use
- THOR NT-5% ➞ First availability (end 2017)
- THORAX input ➞ Better criteria for chest deflection
- DEO ➞ Needs validation of the proposed criteria (end 2011)
- Rib Eyes ➞ Needs validation of R&R
- THIMPR ➞ Needs validation of R&R
- THOR NT 5% ➞ First availability (end 2019)

Frontal Impact

- SIMCAR input ➞ Set of test procedures and associated criteria
- *Full Width Tests*: High deceleration and/or restraint systems
  - FW/PR
  - FW/DB
  - Offset test
  - PD
  - ODB
<table>
<thead>
<tr>
<th></th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>FWRB</td>
<td>+ direct measurement of force</td>
<td>- engine dump not attenuated</td>
</tr>
<tr>
<td></td>
<td>+ harmonized</td>
<td></td>
</tr>
<tr>
<td>FWDB</td>
<td>+ more representative of real world</td>
<td>- instability of deformable element</td>
</tr>
<tr>
<td></td>
<td>+ engine dump attenuated</td>
<td>- not harmonized</td>
</tr>
<tr>
<td>PDB</td>
<td>+ Test severity harmonization</td>
<td>- need FW test to avoid possible side effect</td>
</tr>
<tr>
<td></td>
<td>+ possibility to assess structural interaction</td>
<td>- not harmonized</td>
</tr>
<tr>
<td>ODB</td>
<td>+ harmonized</td>
<td>- instability of deformable element</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- too low stiffness for modern vehicles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- severity increases with car mass</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- self-protection level depends on size and mass</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- no possibility to assess structural interaction</td>
</tr>
</tbody>
</table>
Possible scenario for amendment of ECE R94

Scenario 1

Older
- 50th % needed
  - HIII-50%
  - THOR NT-50%
- THORAX input
  - DEQ
  - Rib-Eyes
  - THMPR
  - THOR NT-50%

Female
- 5th % needed
  - HIII-5%
  - THOR NT-5%
- THORAX input
  - DEQ
  - Rib-Eyes
  - THMPR
  - THOR NT-5%

Frontal Impact
- FIMCAR input
  - Full Width test
    - FWBR
    - FWDB
  - Offset test
    - PDB
    - ODB

2% Benefit in 2014
7% Benefit in 2014
0% Benefit in 2014
Possible scenario for amendment of ECE R94

<table>
<thead>
<tr>
<th>Older</th>
<th>Female</th>
<th>Frontal Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 50th % needed</td>
<td>• 5th % needed</td>
<td>• FIMCAR input</td>
</tr>
<tr>
<td>• HIII-50%</td>
<td>• HIII-5%</td>
<td>• Full Width test</td>
</tr>
<tr>
<td>• THOR NT-50%</td>
<td>• THOR NT-5%</td>
<td>• FWRB</td>
</tr>
<tr>
<td>• THORAX input</td>
<td>• THORAX input</td>
<td>• FWDB</td>
</tr>
<tr>
<td>• DEQ</td>
<td>• DEQ</td>
<td>• Offset test</td>
</tr>
<tr>
<td>• Rib-Eyes</td>
<td>• Rib-Eyes</td>
<td>• PDB</td>
</tr>
<tr>
<td>• THMPR</td>
<td>• THMPR</td>
<td>• ODB</td>
</tr>
<tr>
<td>• THOR NT-50%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2% Benefit in 2015 > 7% Benefit in 2015 > 6% Benefit in 2015

Scenario 2
Possible scenario for amendment of ECE R94

Scenario 3

Older
- 50th % needed
  - HIII-50%
- THOR NT-50%
- THORAX input
  - DEQ
  - Rib-Eyes
  - THMPR
- THOR NT-50%

Female
- 5th % needed
  - HIII-5%
- THOR NT-5%
- THORAX input
  - DEQ
  - Rib-Eyes
  - THMPR
  - THOR NT-5%

Frontal Impact
- FIMCAR input
  - Full Width test
  - FWRB
  - FWDB
  - Offset test
  - PDB
  - ODB

2% Benefit in 2017 → 0% Benefit in 2017 → 6% Benefit in 2017
Possible scenario for amendment of ECE R94

Scenario 4

Older
- 50th % needed
  - HIII-50%
- THOR NT-50%
- THORAX input
  - DEQ
  - Rib-Eyes
  - THMPR
  - THOR NT-50%

Female
- 5th % needed
  - HIII-5%
- THOR NT-5%
- THORAX input
  - DEQ
  - Rib-Eyes
  - THMPR
  - THOR NT-5%

Frontal Impact
- FIMCAR input
  - Full Width test
  - FWRB
  - FWDB
  - Offset test
  - PDB
  - ODB

2% Benefit in 2019
7% Benefit in 2019
6% Benefit in 2019