

**Final Minutes of the Sixth Meeting of the Blue Ribbon Panel for Evaluation of Inflatable Restraint Performance-Field Data Collection and Analysis**

February 19, 2003

Chairperson, Dr. Susan Ferguson, called the meeting to order at 9:30 A.M. in the Atlantic Room at the Double Tree Surfcomber Hotel in Miami Beach, Florida. All panel members and observers were present with the exception of members Dr. Bella Dinh-Zarr and Vernon Roberts and observer Robert Strassburger. Member Dr. Maria Segui-Gomez participated by teleconference.

Dr. Ferguson opened the meeting by noting that the AAAM had agreed to host a session on the work of the BRP at their upcoming meeting in Lisbon, Spain, September 22-24, 2003. There was an extensive discussion of what material the BRP would like to present and whether it would be oral only or written.

Dr. Ferguson wants to focus on data/results, surmising that it will be more interesting to the audience and appropriate now that that case data is becoming available. She suggested that NHTSA cover changes in injury over time in both the NASS and SCI files. Dr. Carra accepted the challenge. Dr. Ferguson asked Dr. Schneider to update his UMTRI analysis. Dr. Segui-Gomez was asked to update and present her NASS based statistical analysis of injury trends in pre and post de-powered airbags. Dr. Segui-Gomez felt it was inappropriate to place herself on the agenda as a presenter since she is the session organizer for AAAM. Dr. Ferguson agreed to present the material if Dr. Segui-Gomez would update. Dr. Ferguson asked Dr. Digges and Dr. Augenstein to present individual cases of interest from both NASS and CIREN.

Dr. Ferguson said that she will need to send a letter to Ann McCart, head of the Scientific Committee at AAAM, detailing the agenda for the session and noting what we would like to be included in the Proceedings of the meeting.

Dr. Ferguson noted that Dennis Durbin of CHOPS, (Children's Hospital of Pennsylvania Study of injuries to children in vehicle crashes) has completed some analyses of injuries to children in 1998 and later vehicles. The Panel agreed that it would be desirable to include presentations at the AAAM session and BRP Public Meeting from others outside the BRP, provided that it was based on good research and data. Dr. Ferguson said that she would contact Christie Arbogast to discuss CHOPS willingness to participate.

The discussion now turned to the BRP Public Meeting scheduled for April 4, 2003. Tom Carr discussed the logistics for the meeting. It will be held at the new Reagan Center, Rotunda Room in Washington, D.C. Continental breakfast and lunch will be served.

Two lists of potential attendees were passed out and discussed. It was decided to mail out invitations to a list, but to not restrict attendance to the invitees. It was noted that the Rotunda Room has a capacity of approximately 125 persons. The letter of invitation will

describe the purpose of BRP and history and ask for an indication of intention to attend. Dr. Ferguson will check to see if the BRP web site can be used to document intended attendance. Dr. Ferguson will draft the letter of invitation and send it out soon. Tom Carr will put together a combined invitation list. Any additions or corrections to the list should be sent to Tom ASAP.

At this point Dr. Ferguson said she would like to discuss the details of the agenda for the Public Meeting and run through some of the presentations. She ran through a draft presentation which outlined the background, composition and progress to date for the BRP. Various panel members noted suggestions for additions, corrections and deletions

Next, Chip Chidester ran through two presentations: "Evolution of Air Bag Technology" and "NASS CDS, Alliance and SCI Air Bag Related Injury Data." The Panel noted that they would like to emphasize the importance of EDR readouts to effectively analyzing airbag performance for injury mitigation. Chip will incorporate the noted suggestions and email the presentation to the Panel members.

Dr. Schneider ran through his presentation: "Comparison of Frontal-Crash Protection for Front-Seat Occupants in Pre-1998 and 1998+ Model-Year Vehicles." Dr. Schneider said that the analyses of UMTRI cases were performed to try to answer two basic questions: 1) Is there a reduction in airbag induced injuries? 2) Is there a reduction of overall effectiveness for Post-1998 airbags as compared to Pre-1998 airbags?

UMTRI has investigated 317 frontal crashes involving Pre-1998 airbag systems and 210 frontal crashes with Post-1998 airbag systems for which a reconstruction of the crash severity was based on a full vehicle inspection. Dr. Schneider noted that they have many "success stories" where Post-1998 systems have protected drivers in severe frontal crashes. Similarly, they have very few cases where the Post-1998 airbag was "overpowered" and failed to provide adequate occupant protection to an unbelted driver. He showed a couple of severe frontal crashes where it appears that the unbelted driver may have overpowered the airbag. He noted that this is not a new phenomenon – that such cases also were present before depowering.

Dr. Schneider noted that they do see, in both pre- and post-1998 vehicles, some AIS $\geq$ 2 injuries associated with an unbelted driver getting over or around the airbag. He also noted that they are seeing relatively few cases in 1998+ vehicles where airbags are thought to have caused serious injuries, although they do have two cases where a depowered airbag "flung" the occupant rearward or upward in low severity crashes, resulting in fatal head injuries.

Logistical Regression analyses were conducted on the study data. The overall predictors of injury in order of importance are: crash severity, seat belt usage and occupant age. The overall conclusion of the analysis is that frontal crash protection in Post-1998 vehicles for the 5 body regions of greatest interest (head, face, neck, chest, and abdomen) is a least as good as the Pre-1998 vehicles. Dr. Schneider showed a variety of other results too numerous to detail here. The reader is referred to the BRP web site

(<http://www.highwaysafety.org/presentations/brp/>) for additional details of the presentation.

It was agreed that Dr. Segui-Gomez would update the paper that she co-authored for the AAAM annual meeting. The title of the paper is: "Changes in Injury Patterns in Frontal Crashes: Preliminary Comparisons of Drivers of Vehicles Model Years 1993-1997 to Drivers of Vehicles 1998-2001. The study concluded that drivers in model year 1998-2001 are more likely to sustain no injuries than drivers in older vehicles (30.0% vs. 25.3%, respectively). Also, drivers in more modern vehicles are less likely to sustain injuries to the extremities than drivers in older vehicles, although these differences are only borderline significant. The airbag deployment rate seems to be significantly lower in the later model vehicles, consistent with the announcement by vehicle manufacturers that they intended to raise deployment threshold levels. The paper is posted on the BRP web site.

Dr. Ferguson suggested that Dr. Digges and Dr. Augenstein run through new NASS cases of interest. Dr. Ferguson asked NHTSA observers if they could list the NASS case numbers for potential cases of interest. Chip Chidester suggested that we look at all the cases with a  $\Delta V$  of above 25 mph (66 cases) and with a MAIS of above 3 (41 cases). Chip will check with other NHTSA personnel to see who is planning on attending the Public Meeting. He will also check for a potential conflict with a CIREN meeting that was believed to be scheduled for April 3 and 4 and see if there was some flexibility in scheduling.

There was some discussion and then it was decided to hold another BRP meeting prior to the Public Meeting in order to do "dry runs" of the presentations. The meeting was proposed for the week of March 24, 2003. Members are to get back to Dr. Ferguson with preferred days for that week. Dr. Ferguson wants to talk about preferred cases for the Digges/Augenstein presentation the week of March 10, 2003 and asked NHTSA to have the list of potential candidates available by then.

Dr. Augenstein discussed an interesting airbag case that his team had recently investigated and suggested that the BRP should reconvene at the Ryder Trauma Center the following morning to run through the case. The BRP agreed to reconvene at Ryder at 9:30 A.M.

Upon reconvening at Ryder, Dr. Digges ran through a case where a 1999 Chevrolet Trail Blazer struck a concrete light pole head-on at a delta-V of 35-38 mph. The driver suffered only minor injuries, but the right front passenger suffered multiple fatal injuries to the chest and internal organs. There was extensive discussion as to whether the RF passenger sustained the injuries from over-powering the airbag or the airbag caused the injuries due to a "punch-out" effect. It was agreed by all that the preponderance of evidence indicated that the RF passenger was on top of or near the airbag module at the time of airbag deployment and sustained the injuries from the airbag. The EDR indicated that airbag deployment was timely (5ms from algorithm initiation). There was an

extensive discussion of whether the advanced airbag technologies that are currently proposed would have prevented the injuries. Some believed they would, others did not.