

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

October 29, 2001

Chairperson, Dr. Susan Ferguson, Senior Vice President, Research, of the Insurance Institute for Highway Safety (IIHS) called the meeting to order at 10:00 A.M. at the IIHS offices in Arlington, Virginia. All panel members and observers were present with the exception of Dr. Mark Edwards. Dr. Ferguson asked if everyone had a copy of the draft minutes of the second meeting and a copy of the comments that Larry Schneider had provided on the draft minutes. Dr. Ferguson then moderated a discussion of Larry's suggested changes to the draft minutes. On page one it was agreed to add the sentence beginning: Larry responded by noting...

There was a discussion of exactly what the subjective terms lower and moderate severity mean in objective terms such as barrier equivalent velocity. Some pointed out that the manufacturers are raising air bag deployment levels and it will become increasingly important to assess the injury mitigation effects in the transition zone (bag deployment vs. no bag) for both belted and unbelted occupants. After further discussion, there seemed to be consensus that it was probably a moot issue since the sampling plan was being set up to sample all severe crashes and over sample moderate severity crashes and the only low severity crashes that would be investigated would be those to round out the investigators time.

Larry said that he thought that Dr. Augenstein's comments about building resources into the process for investigating some unusual cases had been misinterpreted. Dr. Augenstein elaborated that he thought there should be some technical oversight of injury mechanism decisions by an expert medical panel. Chip Chidester described the process that has been ongoing with NHTSA SCI and NASS cases wherein manufacturers, crash investigators and other experts are often consulted on cases where injury mechanism decisions are difficult or questionable. He invited similar participation on the part of Panel members with the Alliance funded NASS cases. There seemed to be consensus that injury mechanism decisions are often difficult and will become even more so in the future as we move to advanced air bag technologies such as multiple deployment levels. However, there was also recognition of the limited resources for this data collection effort and the reason for choosing NASS in the first place was to get a large enough representative sample for making statistical estimates of the efficacy of advanced air bags on injury mitigation. At this point Larry suggested the Panel ignore his comments on the bottom of page 1 and page 2.

The discussion moved to page 4 of the draft minutes where Larry noted that NASS identified cases could be investigated by experienced investigators at UMTRI and other places. Dr. Carra and Chip Chidester pointed out that the investigators at the new

Alliance funded NASS PSUs had already been hired and that four of the six new hires were experienced, coming from existing NASS sites.

Larry added a comment that all Alliance funded cases should be easily identified from regular NASS cases. Dr. Carra and Chip Chidester assured that the Alliance funded cases will be identified as a “Special Study on Advanced Occupant Protection Systems.” Additionally, the cases can be identified as coming from the 3 new PSUs. It was agreed that Larry’s comments on Page 4 would be added to the final minutes. It was also noted that a Memorandum of Understanding between the Alliance and NHTSA was being drafted. The MOU will detail the relationship between the Alliance funded and regular NASS cases as well as other aspects of the Alliance funded data collection effort. Tom Carr noted that the MOU had not been completed at the time of the meeting. It was agreed to add Larry’s comments on page 5 to the final minutes. Dr. Ferguson asked for approval of the Draft Minutes with the above noted additions. The modified Draft Minutes were approved by unanimous voice vote.

Tom Carr made a presentation to update the Panel on progress for the data collection efforts. Three new NASS PSUs have been finalized. They are:

- Dade County, Florida (all of the County, except the city of Miami; this is a former NASS PSU). The team leader comes from the existing NASS PSU in Flint, Michigan.
- Helena, Alabama (5 counties in central Alabama). The team leader has 2 years of NASS experience and the crash researcher has 1.5 years of NASS experience.
- Richardson, Texas (Dallas county). The team leader has 2 years of NASS experience and the crash researcher is a retired EPA chemist.

The Alliance has signed three contracts: 2 with the NASS Zone Centers (KLD Associates on 8/14/01 and Veridian Engineering on 8/20/01) and one with Volpe National Transportation Systems Center, Research and Special Programs Administration of the U.S. Department of Transportation. Tom Carr estimated the contract amounts to be: \$1.2m Veridian, \$2.4m KLD and \$0.8m Volpe. (The actual contract amounts as detailed in an email from Tom Carr to Don Bischoff dated 10-30-01 are: Veridian, \$1,120,067; KLD, \$2,285,756.46 and Volpe, \$869,387).

Larry Schneider expressed concern about the amount of money going to Volpe and asked for clarification as to what they were doing. Dr. Carra and Chip Chidester explained the NASS case collection is now completely electronic and that Volpe has responsibility for establishment and maintenance of the electronic system. Thus, a large portion of the money goes toward the purchase of computer equipment and secures high-speed data lines between the PSU, the Zone Centers and Volpe. Dr. Carra said that both NHTSA and Alliance representatives had extensively scrutinized the proposed contract to ensure that there are no unjustified expenditures. Dr. Segui-Gomez also expressed concern over the cost vs. performance of Volpe based on past experience.

The first module of basic training of the new PSU hires was conducted at the Transportation Safety Institute (TSI) in Oklahoma City, Oklahoma on October 22-26. The crash investigators are now doing on-site preparation and collecting some test cases. The second module of training at TSI (on-site application) is scheduled for December 10-14. The third module of training at TSI (on-site reduced caseload pilot investigations) is scheduled for February 11-15, 2002. Formal NASS case collection is scheduled to begin April 1, 2002. The total number of cases projected to be collected over the four-year contract period is 1350. The contract period is comprised of 3 full years of data collection at 450 cases per year, preceded by a 6-month ramp-up period and followed by a 6-month wind-down period. It was pointed out that these cases could be combined with the regular NASS cases for analysis purposes. The question was asked as to the total number of regular NASS cases that NHTSA is collecting yearly. Dr. Carra said that the current NASS yearly total is approximately 4300 cases; down from the historical annual yield of approximately 5000 cases. Dr. Carra explained that the NASS funding has been flat for several years and that inflation and other increases have eaten into the available funding. To make up for the funding deficit, the agency has not filled some of the vacant crash investigator positions, thus the reduced caseload. Asked about the current total yearly funding of NASS, Dr. Carra said that it is \$10.75m.

At this point, Dr. Ferguson introduced a discussion of the role of the BRP in analysis of the crash data once it is collected. Dr. Ferguson said that the two principal uses of NASS data at IIHS are case-by-case analyses and analysis of overall effectiveness of occupant protection using the complete NASS file.

Chip Chidester said that NHTSA has contracted for a clinical review of all crash investigations involving a vehicle with a redesigned air bag. The contract is with John Morris and Lee Stucki, two former NHTSA Research and Development employees, who have extensive experience with evaluating air bag performance. The review will cover 700 cases of 1998 and later vehicles, looking at injuries incurred by both drivers and passengers.

Dr. Augenstein once again reiterated his belief that we need an expert review panel to look at cases that may be controversial in terms of air bag related injury. Larry Schneider suggested that we might need a different contractor for statistical analyses versus review of anecdotal cases. Dr. Digges noted that we should analyze effectiveness by body region in addition to overall effectiveness; pointing out the effectiveness of first generation air bags was very different when looking at head, thorax and upper extremities separately as compared to overall effectiveness.

Some of the Panel members thought that it would be nice to have a 1 or 2 page summary of each NASS case to facilitate review. Dr. Digges said that one of his graduate students had developed a quasi-automated computer program for producing case summaries from the full NASS file. Chip Chidester said that he thought that this type of activity was no different than the "front-end" previously discussed for the NASS system. Later in the meeting Larry Schneider showed a 2-page summary of a University of Michigan CIREN case that he had loaded on his laptop. Dr. Segui-Gomez said that we might need a

contractor to review cases and pick out sentinel cases for review of BRP. Dr. Carra said that no matter what we do, making the data available to everyone should be a first principle.

The discussion now shifted to the Volpe proposal to the Alliance to modify the NASS web site to include the ability for any user to select and review NASS CDS cases via the WEB as soon as approved by NHTSA. Volpe proposed to accomplish the goal through the execution of four tasks: modify CDS case migration, modify CDS WEB search engine, modify WEB printing using XML output and associated travel. There was extensive discussion of the details of the Volpe proposal from both a technical and cost perspective. Dr. Digges described a software program developed to summarize subsets of cases from the NASS SAS file. All agreed that we sorely needed a means for at least selecting and reviewing cases based on some particular case variables; however, both the Alliance and NHTSA had already committed all available funding. At this time, Tom Carr committed the Alliance to making every effort to seek funding for Task 1 of the proposed effort. It was agreed to temporarily table discussion of the 2-page summary and explore funding at a later date.

Don Bischoff asked what plans the Panel should make for analysis of the FARS file or at the very least monitor what others might be doing. He pointed out that NHTSA has been conducting air bag effectiveness analyses using FARS on a yearly basis. Analyses using the FARS file will likely give an indication of any change in effectiveness for redesigned air bag systems long before similar NASS analyses, albeit only for potentially fatal crashes. There was an ensuing discussion of the types of statistical analyses that can be done using the FARS file, e.g. double pairs comparison. Mr. Bischoff suggested that the BRP might want to contact NHTSA Plans and Policy and invite Dr. Kahane to make a presentation to the BRP on the agency's plans for analyses of air bag effectiveness using the FARS file. It was agreed that this was a good idea and Chairman Ferguson agreed to contact the agency.

Dr. Segui-Gomez made a presentation to the BRP on calculations that she and Dr. Chuck Farmer (IIHS statistician, BRP observer) have completed to estimate the sample sizes of cases necessary for evaluation of new air bags. The objective of these analyses is to evaluate the changes in air bag performance on the incidence of moderate and severe non-fatal injuries. Four specific goals were: effectiveness of depowered air bags for belted and unbelted occupants in severe frontal crashes, belted and unbelted occupants in minor frontal crashes with particular emphasis on females of small stature.

The use of the term depowered air bags touched off an extensive discussion of what is the appropriate term for describing the point of demarcation for the new air bags that are of interest for analysis. The terms depowered/pre-depowered, next generation, redesigned, 1998 Model Year and later, engineered to comply with the FMVSS 208 sled test, and other 208 rulemaking benchmarks were all debated. In recognition of the fact that extensive changes in air bag design have been occurring over time and will continue into the foreseeable future (including depowering, but not exclusively depowering) the

consensus seemed to be that the best we could probably do for analysis purposes would be to use Model Year 1998 and later.

Dr. Sequi-Gomez estimates that to have an 80% power in detecting a 20% change in effectiveness in the probability of a max AIS 3-5 injury in non-severe crashes and no changes in the probability of death in severe crashes larger than 20%, the minimum number of “new air bags” non-severe and severe crashes that we need to get are 1873 and 933 respectively. If we want to make evaluations of different types of users (i.e., unbelted occupants in severe crashes or female occupants in minor crashes) then we must obtain the same number of individuals for each of these groups. The implication of these findings is that most of the Alliance cases should be unbelted occupants in severe crashes or female occupants in minor crashes.

It was pointed out that prior analyses have shown that occupant age is also a critical covariate that can influence injury outcome in crashes. The BRP asked Dr. Segui-Gomez to add age effects to her next iteration of sample size calculations. There was also discussion of the appropriate break point for age effects, with 60 being discussed as a potential candidate. It was also decided to add females in crashes less than 15 mph delta V to the next round of calculations

There was a discussion of the appropriate time and venue for the next meeting of the BRP. It was decided that it would be instructive to hold the next meeting at the new PSU in Dade County, Florida on January 28<sup>th</sup> and 29<sup>th</sup>, 2002. Dr. Augenstein volunteered to have a demonstration of his facilities and capabilities at the William Lehman Injury Research Center in Miami, which is both a CIREN and NHTSA SCI contract facility.

Chip Chidester announced that NASS CDS data elements have been expanded for 2002 to include additional data elements on advanced occupant protection. A key component of these additions are the ability to record variables from event data recorder readouts.

Dr. Ferguson entertained a motion to adjourn and it was so moved and unanimously approved by voice vote.