ANSI/RESNA Subcommittee on Wheelchairs and Transportation (SOWHAT)

Unconfirmed Minutes

February 27, 2000
Hyatt Regency Hotel
Vancouver, B.C. Canada

Grouse Room

February 27th, 8:30AM - 5:00 PM

1) Welcome and Introductions — Schneider/Group

Larry welcomed everyone to the meeting as the new SOWHAT Chair. Meeting participants introduced themselves and indicated their interest in the SOWHAT effort.

2) Administrative matters

2.1 Approval of Long Beach minutes — Group

The Long Beach minutes were approved by the committee as distributed (Joe T. moved/Ruth 2nd).

2.2 Goals for Vancouver meeting — Schneider

Larry reviewed the meeting agenda and indicated that one of the primary goals of the meeting is to bring clearer focus to future work items, and to make progress in moving forward toward additions and amendments to the initial WC/19 standard. He indicated that it is not clear how these amendments and additions to the standard are implemented into Section 19 of ANSI/RESNA WC/Volume 1. For example, some new work items, such as developing a test method and criteria for determining wheelchair crashworthiness when secured by a docking system, are supplementary to WC/19 requirements – i.e., a WC/19 wheelchair must still be crashworthy when secured by a four-point, strap-type tiedown and passing the frontal impact test when secured by a docking tiedown is not required to be a WC/19-compliant wheelchair.

2.3 Working Group membership — Schneider

Larry reviewed the new ANSI/RESNA rules for being considered an "active participant" of the working group and having voting privileges. Anyone who attends a meeting is considered an active participant and can vote. You can also become an active participant by having official communication with the Working Group Chair on an issue of substance and relevance to the work of the Group. If you do not have communication with the Chair directly or fail to attend meetings over a 2 year period then "active-participant" status will lapse.

2.4 Mail list and list serve — Schneider

Larry circulated recent mail list and list serve printout and requested participants to check their contact information.

2.5 Distribution and numbering of documents — Schneider/Bertocci

Larry reviewed the full document list and numbered new documents for this meeting, beginning with TW78.

TW78	Memo of 8/2/99 from L. Schneider to members of SOWHAT with eight page summary of pre-ballot voting results and comments
TW79	Summary of SOWHAT documents as of 10/13/99

TW80	Minutes of June 25/26 SOWHAT Meeting in Long Beach
TW81	Letter of 9/13/99 from W. Hostetler to Mr. Galetka re OSU docking system and patent
TW82	10/6/99 response memo from L. Schneider to W. Hostetler
TW83	11/29 memo from W. Hostetler to L. Schneider
TW84	Patent for Oregon State Wheelchair Securement System and memo dated 2/8/00 from W. Hostetler to L. Schneider
TW85	12/23/99 draft copy of Section 19 ANSI/RESNA WC/Vol. 1
TW86	January 14, 2000 memo from P. Axelson and L. Schneider to members of Wheelchair Subcommittee with summary of voting comments, document changes, and invitation to change vote
TW87	Memo of 2//2/00 from Ruth Lytle to P. Axleson and Memo of 2/4/00 from J. Stein to L. Schneider re wording requirements for postural belts
TW88	Agenda for 2/27/00 SOWHAT meeting in Vancouver, B.C.
TW89	List of email addresses on SOWHAT list serve as of 2/23/00
TW90	SOWHAT mail list as of 2/22/00
TW91	Email from Bob Jones to Gina Bertocci regarding "static simulation of crash testing for wheelchair seating systems"
TW92	Two University of Pittsburgh RESNA 2000 Abstracts on wheelchair seating system component testing.
TW93	J. Zaworski Securement System Design and Evaluation Slide Presentation Handout
TW94	J. Zaworski Development of Securement System Evaluation Criteria
TW95	Letter proposal from J Zaworski to SOWHAT Committee 2/27/00
TW96	Letter from Bruce Constantin (EZ Lock Inc) to SOWHAT Committee 2/23/00

3) Status of related work

3.1 SAE J2249 — Schneider

Larry provided an overview of the wheelchair securement standard, SAE J2249 WTORS. A meeting of the J2249 committee was recently conducted in Reno in Feb, 2000. Some of the issues addressed include: modification of surrogate wheelchair fabrication drawings, the universal interface, testing of integrated restraints using the surrogate wheelchair in lieu of using a specific commercial wheelchair and mixing of hardware from different manufacturers.

3.2 ISO 10542 and 7176/19 — Hobson/Schneider

Larry reported that final changes to ISO 10542, the WTORS standard, are being made in response to numerous comments from the last round of voting and discussions held in Valencia in November, 1999. The document will then be distributed for final voting. Also, ISO 7176/19,

the transit wheelchair standard, has undergone recent changes in response to DIN voting, and will be discussed at the May meeting of WG 6 in Stockholm.

3.3 CSA Z604 & Z605 — Schneider

Larry indicated that CSA is still in the process of making changes to these standards to make them compatible with SAE J2249 and ANSI/RESNA WC/19. Draft documents are expected to be sent for Task Group review in a couple of months.

3.4 A real-world success story — Schneider

Larry made a presentation on a recent crash investigated by UMTRI involving a passenger of a Ford van who was seated in a powerbase wheelchair that was provided with WC/19-like securement points. The wheelchair was successfully secured in a 20-mph frontal impact by four-point, strap-type tiedown that complies with SAE J2249. The male wheelchair occupant was not wearing the available J2249 compliant three-point belt but was using pelvic and chest postural belts that provided some restraint and prevented serious injuries to this wheelchair user. However, both belts failed at their attachments to the wheelchair and allowed the occupant to slide out of the wheelchair during the impact. Had the impact been more severe, these postural belts would have not prevented the occupant from flying forward and sustaining more serious injuries from contact with the front of the vehicle. Also, had the wheelchair not been effectively secured, this occupant would have sustained very serious injuries, and perhaps fatal injuries, in this frontal crash. The occupant sustained a contusion to the spleen from belt loading, a laceration to the back of the head from sliding out of the wheelchair, and fracture to a finger on the right hand. This case is a WC/19 success story but also shows the importance of using an effective occupant restraint system in conjunction with a WC/19 wheelchair and an effective wheelchair tiedown.

4) WC/19 voting and implementation

4.1 Changes to WC/19 resulting from balloting — Schneider

The ANSI/RESNA Wheelchair Standards Subcommittee approved WC19 unanimously. Comments were incorporated into a revised document and members of the Wheelchair Standards Committee were provided an opportunity to change their vote. Since no votes were changed, the approval remained unanimous. The document is being put into ANSI/RESAN format and is expected to be published and available for purchase by May or June.

Larry provided an overview of the voting comments (TW86) along with the modifications made to the document as a result of the comments. Appendix I was added to address pelvic belt recommendations. Fig 9b was added to indicate proper placement of the pelvic belt. A recommendation for the maximum tilt of 30 degrees during transport was added. 6.1.3 was modified to allow for some flexibility in wording related to postural belts not being suitable as occupant restraints during transport. A note was added to further define “component detachment” and “partial fracture in seating systems” in 5.3e. See TW86 for additional document modifications. Larry encouraged manufacturers to continue to evaluate the standard as they apply it in design, testing, etc. so that the document can be refined as needed. The listserve is an ideal forum to have discussion on implementation issues.

4.2 Industry reports on wheelchair testing — Group

Convaid has tested all models of wheelchairs to WC19 this year. Recent design modifications included relocation of securement points. Convaid has been receiving feedback from users on the transport features. Sunrise Medical has been conducting WC19 testing - frames are holding-up well; most failures during testing are occurring in seating systems, in particular hardware and seat surface fracture. AES (seating system manufacturer) is testing seating systems with various wheelchair frames. AES is working to secure agreements with wheelchair manufacturers, but indicated an interest in independent seating component testing. E&J - Canada has also been testing to WC19.

4.3 Question/Issue of Re-testing — Schneider/Hobson

Larry addressed the issue of the need to re-test after a failed test when only minor modifications are deemed to be necessary to pass the tests. Peter Axelson indicated that re-testing until the product actually passes the test is needed for compliance with the standard. Joe inquired as to when products that have undergone minor design modifications should be re-tested to maintain certification.

4.4 WC/19 Identification of Implementation Issues Group

4.5 Status of companion WC/19 document Schneider/Hobson

Larry indicated that he will begin work on completing the companion guideline document to WC/19 soon and would appreciate input as to its content. The document will include a section on Answers to Frequently Asked Questions regarding WC/19 and questions that manufacturers and consumers would like to see addressed should be submitted to Larry.

5) WC/19 New Work Items

5.1 After-market Seating Inserts-Research and Testing Bertocci

Gina presented on-going seat system testing at the University of Pittsburgh. The group agreed that we need to continue with our efforts in developing test methods which could evaluate seating systems independent of the wheelchair frame. The next step is to utilize our test methods to evaluate seating systems that have previously been successfully tested to WC/19 30mph, 20-g frontal impact test. Tom Novotny of AES agreed to provide their seating components which passed sled testing for evaluation by the University of Pittsburgh. It was recognized that in some cases, wheelchair seating manufacturers are joining with wheelchair manufacturers for testing of the combined systems. However, seating manufacturers expressed that this is by no means inclusive to all seating manufacturers, and there is a need for an independent seating system tests.

5.2 Other-than-4-point wheelchair securement

5.2.1 Test method, criteria, and labeling for Schneider

Larry indicated that procedures and performance criteria for testing wheelchair designed for securement by other types of tiedowns needs to be added to the standard. A wheelchair will still need to be tested with the four-point securement system to be considered a WC/19 wheelchair, but there needs to be a way for wheelchair manufacturers so demonstrate that their wheelchair is also crashworthy for other methods of securement. An important aspect of this addition to the standard is the labeling of the wheelchair, and other information that must be provided about the other methods of securement for which the wheelchair is crashworthy.

5.2.2 Universal Docking Concept Upitt /Zaworski

Joe Zaworski showed a video on the Oregon State Universal Securement System. The video detailed the design and evaluation process followed in development of the Oregon State docking system. Joe also presented The Development of Securement System Evaluation Criteria (TW94) and the actual evaluation of the docking system. The docking system was sled tested. One transit company in Anchorage, Alaska has chosen to utilize the OSU system and has equipped approximately 80 wheelchairs with interface for the docking system. Operators and consumers had positive impressions of the docking system and its usage. Weight and extension beyond the wheelchair and the ability to do wheelies were negative issues raised by consumers regarding the wheelchair interface. Joe indicated that the key to docking systems is equipping wheelchairs with a universal interface. Joe distributed a proposal (TW95) to the WG for a wheelchair interface which consists of a receptor to be made available on the wheelchairs, but allowing the interface hardware to evolve. Joe expressed that the WG would not be able to define the “best” interface. Meeting participants expressed a concern with the proposal citing the need for a standard interface hardware to assure user independence and compatibility across all transit systems. Kinedyne indicated that they will not develop a docking system until a standard interface is available.

Doug Hobson presented the University of Pittsburgh work on the universal interface concept. Doug presented UI development history, proposed UI key specifications, and UI concept

evaluation. Doug also presented a new proposal for a UI which included accommodation for strap-type tiedown securement points. Doug proposed evaluation of his newly proposed UI hardware with commercially available wheelchairs. At the recent SAE meeting, key issues to be addressed in the development of a UI were identified and will be debated by a sub-group of the SAE committee. Larry pointed out that the UI is more of a wheelchair issue as opposed to a securement issue. It was agreed that a SOWHAT Task Group must also be identified. ISO 10542-3 is addressing docking systems and the UI on an international basis. The UI concept will be addressed in an Annex to 10542-3. Doug pointed out that we now have a unique opportunity to orchestrate a global approach in the development of a UI. Doug, Joe, Larry, Gina and Joe were initially identified as participants interested in the UI task group. It was suggested that the SAE task group be combined with this SOWHAT Task Group.

Joe asked that the EZ-Lock and OSU concepts also be included in proposed UI concepts.

5.2.3 Issue of Patents **Group**

Patent Issue – Bill Hostetler, Director of OSU Tech Transfer Office, has indicated by correspondence that any standardized interface concept will be infringing upon the OSU patent. Larry reviewed the OSU patent. In general the WG needs to recognize patents which exist related to a securement/wheelchair interface. EZ Lock letter was reviewed related to development of an interface and their planned participation.

5.3 Secondary and postural supports **Group**

not discussed

5.4 Expansion of WC/19 to small children **Group**

not discussed

5.5 Other impact directions - rear and side **Group**

not discussed

5.6 Development of a new Scope work statement **Group**

Larry reviewed a new scope of work statement with the group.

5.7 Implementation of Changes to WC/19 **Schneider**

6) New Business **Group**

no new business

7) Review of assignments and action items **Schneider/Bertocci**

8) Next meeting dates/locations **Group**

Possible venues for the next meeting include the October 2000 ISO meetings in Montana. Med-Trade is Oct 3-6th but may be in conflict with the ISO meetings.

Note: It has subsequently been decided that the next meeting will be held in Pittsburgh on Sunday, October 22nd.

9) Adjournment **Schneider**

Larry thanked the attendees for their participation and adjourned the meeting at 4:30 PM.

SOWHAT Scope Statement

2/27/00

With the successful completion of the initial standard for Wheelchairs Used as Seats in Motor Vehicles, Section 19 ANSI/RESNA WC/Volume 1, the working group (SOWHAT) will work on other transportation related issues concerning wheelchair design and performance, for inclusion in future revisions, amendments, and additions to the standard. Additional work items include:

1 Companion Document

2 After-Market Seating Systems

Develop test methods and performance criteria to evaluate after-market seating systems for occupancy in motor vehicles independent of testing with OEM wheelchairs. These tests may include pre-evaluation tests as well as tests and criteria that demonstrated performance to requirements of WC/19 wheelchair seating systems testing.

3 Secondary Supports and Surfaces

Establish design and performance requirements for wheelchair secondary support surfaces (e.g, armrests, padded side supports, trays, postural belts, head and neck supports) that are suitable for use in a motor vehicle.

4 Crashworthiness of Wheelchairs Secured by Other (than four-point) Methods

Document test methods and performance criteria for evaluating the crashworthiness of occupied wheelchairs when secured by tiedown systems other than four-point, strap-type tiedowns. Develop requirements for manufacturer's literature and wheelchair labeling associated with these other types of wheelchair securement.

Note: In order to comply with WC/19, the wheelchair must continue to meet all the requirement for four-point, strap-type securement.

5 Universal Docking Interface

Develop specifications for universal docking-type securement of wheelchairs, including requirements for the geometry of the wheelchair docking hardware, as well as location and clearance requirements. Validate that the specifications for the docking concept are practically achievable with a wide range of wheelchair types and models, and that the wheelchairs can be effectively secured under expected vehicle impact conditions. Determine a suitable vehicle/crash environment for implementation of a first-generation universal-docking concept.

6 Restraint of Small Children

Expand the initial version of WC/19 to include requirements for restraint systems used by children under 22 kg in mass.

7 Side Impact Crashworthiness

Establish test methods and performance requirements that establish measures of wheelchair crashworthiness for impacts to the side of a vehicle.

8 Rear Impact Crashworthiness

Establish test methods and performance requirements that establish measures of wheelchair crashworthiness for impacts to the rear of a vehicle.

9 Harmonization with ISO and CSA

The WG will work to rank order these items. Larry will also prepare a document which addresses testing a wheelchair using securement systems other than 4-pt tiedowns.