



## Heads Up Issue 17

**Date:** September 10, 1997  
**To:** All Snell Certified Manufacturers  
**From:** Edward B. Becker, Executive Director

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This is the seventeenth of the Foundation's quarterly newsletters to the helmet manufacturing industry. The sixteenth was sent out last June. Comments and items for inclusion in subsequent issues are invited.

### **Anaheim Manufacturers' Meeting**

The manufacturers' meeting took place Wednesday, September 3, 1997 in Anaheim, California, just prior to the Interbike Show. Dr. Fenner, Gib Brown, Steve Johnson, Frank Lin and Ed Becker represented the Foundation.

Dr. Fenner, the Foundation's president, opened the meeting and welcomed the attendees. Frank Lin then discussed the Foundation's internet site. Frank's presentation is summarized further on but there are two points worth repeating: links to certified manufacturers and the Snell certified products lists. All certified manufacturers should check the lists to ensure that their certified products are present and are correctly listed. Then, if you have your own web site, please allow us to set up a link. Many of the visitors to the Snell site browse through the certified helmets and then access the manufacturers for more information. We believe in these Snell certified helmets and want to see them on peoples' heads. We hope that the Snell web site will help make this happen.

Ed Becker presented a comparison of twin-wire versus monorail impact testing. This comparison drew on data collected for the Consumer Product Safety Commission's study. Snell collected data on both kinds of impact device but using the same instrumentation. As a result, we were able to study the mechanical artifacts introduced by the mechanical systems without any instrumentation bias.

Although this study is not yet completed, there is no indication that either system is inappropriate for helmet testing. A brief summary of the presentation is included further on.

## **Harborview Study**

Over the last year, the study of bicycle injury performed by the Harborview Medical Center Injury Prevention and Research Center has culminated in several papers published in scientific and medical journals:

Thompson DC, Rivara FP, Thompson RS. Effectiveness of bicycle safety helmets in preventing head injury: A case control study. *JAMA* 1996; 276:24:1968-73.

Thompson DC, Nunn ME, Thompson RS, Rivara FP. Effectiveness of bicycle helmets in preventing serious facial injury. *JAMA* 1996; 276:24:1974-75.

Thompson DC, Rebolledo V, Thompson RS, Kaufman A, Rivara FP. Bike speed measurements in a recreational population: Validity of self reported speed. *Injury Prevention* 1997; 3:43-45.

Thompson DC, Thompson RS, Kaufman A, Rivara FP. Increasing bicycle helmet effectiveness: The importance of proper fit and wearing position. *HMO Practice* 1997; 11(1):25-26.

Rivara FP, Thompson DC, Thompson RS, Rebolledo V. The epidemiology of bicycle injuries and risk factors for serious injury. *Injury Prevention* 1997; 3:110-114.

Rivara FP, Thompson DC, Thompson RS, Rebolledo V. Injuries involving off road cycling. *Journal of Family Practice* 1997; 44(5) 481-485.

Ching RP, Thompson DC, Thompson RS, Thomas DJ, Chilcott WC, Rivara FP. Damage to bicycle helmets involved with crashes. *Accident Analysis & Prevention* (in press September 1997).

The Foundation published an overview in September, 1996, which provides a clear, concise summary of the study and its important findings. **Circumstances and Severity of Bicycle Injuries** by Rivara FP, Thompson DC and Thompson RS has been posted on Snell internet web site.

## **Snell Web Site**

The Snell Foundation World Wide Web Site, <http://www.smf.org>, now includes more than thirty pages of helmet and head protection information. There are descriptions of the Foundation and its certification programs, lists of certified products, links to ftp downloads of Snell Standards and drafts and links to other web sites of interest.

Dr. Frank Lin maintains the site and makes bi-weekly additions and updates to the materials. Frank has received many compliments for his clear, entertaining and user-friendly presentation of this useful information. In the last six months, Sympatico, one of Canada's largest internet providers, gave the Snell pages a Four Star rating in a survey of health related web sites.

One of the primary purposes of the site is to acquaint the public with the importance of selecting and wearing the most effective protective headgear. Once the Foundation tests and certifies a helmet, we want people to wear it. If you manufacture or sell Snell certified helmets and you maintain an internet web site, please contact Dr. Lin to see about establishing a link.

Frank welcomes comments and suggestions regarding any aspect of the web site.

### **Impact Device Comparison**

Last December the Foundation cooperated in a Consumer Product Safety Commission study of twin-wire and monorail impact test devices. Since the Foundation has both types of device, our participation afforded an opportunity to perform our own comparison. Our comparison is necessarily much narrower than the CPSC study which includes data from many test organizations involving many different hardware configurations.

However, our study may be deeper. The CPSC study compares peak acceleration only. Our comparison considers the entire impact acceleration time history and will attempt to identify mechanical artifacts associated with each device type.

Although the study is not yet complete, there are a number of observations worth describing. Both Snell systems are remarkably repeatable. In impacts between a falling sphere and the CPSC's MEP pad, we were impressed at how successive impacts overlay each other. Not just during the period of actual impact but even well after the sphere had rebounded from the pad.

We also noted system resonances in the twin-wire device. The interaction between the sphere and the MEP contains excited a 200 Hertz vibration in the twin wire hardware which persisted long after the sphere had rebounded from the pad. A deconvolution analysis suggests that this resonance did not affect the peak acceleration measurement and that the resonance effect would be negligible in a helmet test. The MEP pad is much stiffer than current helmet configurations so that helmet impacts could not excite the 200 Hertz vibration to any significant degree.

Finally, there appeared to be a strong rotational effect in the monorail impacts. Essentially, an offset in the system center of gravity forced by the monorail system hardware causes the system to rotate in response to impact. The rotation produces a higher measured acceleration during the test. Although the monorail permits only a tiny amount of rotation, about 20 minutes of arc or one third of a degree, the time domain is down in the milliseconds. Comparison of the acceleration traces seems to support conclusions that the initial monorail accelerations are about 10% greater than the twin-wire measurements because of these rotational effects. Furthermore, the acceleration traces suggested interference in the monorail bearing systems during the impact event.

If the conclusions are correct, bearing forces must certainly exceed 1000 lbs and could go considerably higher. Since most of the commonly used bearing sets are rated for 250 lbs or less, it is no surprise that many have found that bearings must be replaced regularly.

Mr. Serge Dextraze of Cadex reports that there are bearings available that are rated for 1000 lbs but also that some investigators have measured bearing forces in excess of 5000 lbs.

It is important to state that there are no indications that either system is inappropriate for helmet testing. The differences observed in peak acceleration are on the order of the calibration error of the accelerometers. Selection of impact test gear should continue to be based on local needs and conditions.

### **HPE Opens in England**

Brian and Paul Walker have established HPE, a private, for-profit, helmet testing company at the former Snell UK site:

HPE Group  
Unit 4 Farnham Business Centre  
Dogflud Way  
Farnham, Surrey GU9 7UP  
England

We wish Brian, Paul and HPE all good fortune. I hope that they will continue to be able to provide advice and guidance to me and my colleagues in the US, and technical testing services to the European community and beyond.

### **ISO Guide 25 Accreditation for Snell, CA**

As of June 2, 1997, the Snell Memorial Foundation's California laboratory has been awarded American Association for Laboratory Accreditation (A2LA) approval for helmet testing. A2LA is an internationally recognized authority administering quality laboratory accreditation programs to ISO/IEC Guide 25 "General Requirements for the Competence of Calibration and Testing Laboratories." The scope of the A2LA accreditation includes all of the tests covered in the Foundation's bicycle, motorcycle, auto racing, non-motorized sports and harness racing helmet standards. The accreditation confirms that the Foundation's California laboratory has the capability to perform Snell testing and has the quality control necessary to assure the accuracy and validity of Snell test results.

The Foundation sought this accreditation as part of its continuing commitment to quality. Since its beginning in 1957, the Foundation has urged manufacturers to design and build quality protective helmets and has urged the public to seek out and wear them. As a recognized authority in helmet safety, it is proper that the Foundation submit itself to another recognized authority to demonstrate the quality of its own testing programs and procedures.

The Foundation looks forward to continuing in the A2LA program in order to increase the recognition and value of Snell Certification Programs for both helmet manufacturers and the helmet wearing public.

### **Consumer Reports Bicycle Helmet Evaluations**

The June issue of Consumer Reports included an article on bicycle helmets. The article warned consumers about a widely used plastic buckle component and also awarded a surprisingly low impact protection rating to one helmet currently certified to the Foundation's B-90 Standard.

We reviewed our test records and conducted additional testing immediately. We have concluded that the buckles and the helmet all perform to the Snell requirements and that Snell Certified helmets continue to provide premium levels of head protection. We remain convinced of the accuracy of Snell testing and of the protective capabilities of the fine bicycle helmets we certify.

Anyone who has read the Consumer Reports article and who has concerns over the buckle or the capabilities of any Snell Certified helmet is invited to call our special toll free number, 1-888-763-5599 (1-888-SNELL99). This line comes directly into our offices, I or one of my colleagues will do our best to explain the tests and their significance.

### **Snell Safety Education Center (SSEC)**

As of December, 1996, the Snell Safety Education Center, a California non-profit corporation, has taken up the Snell Memorial Foundation's effort to promote the widespread use of protective headgear. The Center is dedicated to all the ideals of the Foundation: to engage in scientific, educational and charitable activities; to research and develop safety equipment for the prevention of injuries; and to develop and provide information, materials and services to encourage the use of safety equipment. However, the Center is a distinct and autonomous organization. Since there is no connection to the Foundation's testing and certification programs, the Center will be able to work more directly with consumer groups, helmet manufacturers and other charitable organizations.

Ms. Hong Zhang, who organized and directed the Foundation's current helmet education programs, will continue these efforts as president of the Snell Safety Education Center. As with the Foundation, Ms. Zhang expects to work closely with state and community groups dedicated to public safety. Working through the Center, Ms. Zhang hopes to improve and expand the support provided to these vital state and community programs.

### **S-97 and L-97 Standards**

The 1997 Standard for Protective Headgear Used in Skiing and Other Winter Activities (S-97) and the 1997 Standard for Protective Headgear for Use with Low Powered Vehicles, Mopeds and Motorized Bicycles (L-97) are now in their final form. Copies of these two new Standards as well as the Foundation's draft equestrian helmet standard are available from the Foundation's North Highlands Office.

Manufacturers are invited to submit samples for evaluation with respect to S-97, L-97 or the equestrian draft standard. Please contact the North Highlands office for further information.

### **Whom to Contact at Snell**

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Certification Labels: Ms. Bonnie Adams  
Public Education: Ms. Hong Zhang  
Administrative: Steve Johnson  
Internet Web Site: Frank Lin  
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