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The Quarterly Newsletter of the Snell Memorial Foundation

This is the thirty-fourth of the Foundation's quarterly newsletters to the helmet manufacturing industry. The thirty-third was sent out in November. Comments and items for inclusion in subsequent issues are invited.

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Manufacturers ♦ Meeting

This years manufacturers ♦ meeting took place on Friday, February 14, 2003, the day before the opening of the Indianapolis PowerSports Expo, at the Hampton Inn. The meeting was well

attended. The Foundation was represented by Dr. Fenner, president of the Foundation's board of directors, and by Randy McCarty and Ed Becker of the Foundation's staff. The Foundation's directors met October 19, 2002, at the Sacramento offices. Among the items discussed were: new policies for handling helmet models found non-compliant in the RST program, a new labeling requirement for certified headgear, a symposium sometime next spring to discuss head protection for children participating in motor sports and modifications to the Snell lab facilities to enable test impacts on the order of 250 joules (10 meters per second). See items later in this newsletter.

Your comments and advice are welcome, particularly for the noncompliance policies which the Foundation's directors are considering at the next board meeting in late April.



Noncompliance Policy Proposals

The Foundation has two different test modes: one to establish that a particular helmet configuration meets Snell requirements and another to establish that a model does not meet the requirements. The first test mode is used for certification and for regular, first round testing in the RST program. If a failure is noted in this first round, three more samples are purchased and tested in the second mode, a failure in this second round RST testing establishes that the configuration no longer meets the standard. Should a failure occur in this second round, the matter is referred to one of the Foundation's board of directors, the Director for Standards Adherence, for resolution. Currently, the director always requires that production stop until the problem is corrected and new samples are submitted for and pass certification testing. Further steps such as recalls and public notices are only considered in those cases where the observation implies a hazard to the public.

The proposed changes are these: an increase in the fee for second round testing, more exhaustive checking before a configuration failing second round testing can be returned to distribution and a prolonged suspension from Snell programs for models that fail second round testing more than once. The increase for second round will be from the current US\$120 to US\$250. The intent is to cover the additional expense of the acquisition and handling. The program will be reviewed and the fee will be increased as necessary to offset the real costs of second round testing.

If a sample fails in second round, production will be required to stop until the problem has been identified and samples have been submitted for and passed certification testing. However, distribution of Snell certified units may not resume until a samples have also passed an initial random sample testing. That is: the manufacturer must first produce a reasonable number of units and notify the Foundation that these units are ready for inspection and sampling. At manufacturer expense, the Foundation will send a representative to the factory to inspect the units to assure that they have, in fact, been produced and then to select units for random sample testing. Distribution may resume only if the samples pass.

If the samples fail, or if the configuration should fail again, later, the Foundation will require that production stop and will not consider any application for recertification for at least one year. In short, the manufacturer would not be permitted to produce or distribute any Snell labeled units under that model name nor any of the other model names under which the failing helmet was sold.

The proposed changes also include new procedures for the Foundation's public lists of certified products. The first time a configuration fails second round RST, the manufacturer will have two months to submit for and pass certification testing. If he fails to do so, a notation will be added to every corresponding model name on the Foundation's lists saying "certified through..." and giving the date of the second round failure. This posting will remain on the lists for at least one month. A second instance of failure will result in an immediate annotation. The distinction is slight. If I'm shopping for a helmet, I'll look for an A+ but if I already own an A-, I'll wear it happily and save my money for something else. However, as a helmet certifier, the Foundation must do everything reasonable to ensure that the Snell label goes only into A+ units.

Several people have brought up the possibility of a required recall of Snell labels after a second round failure. Although the directors have ordered such recalls in the past, heretofore a recall has required the consent of a majority of the board members and has been undertaken only in the interests of public safety. Even so, such a measure would also encourage closer compliance with Snell Standards and might forestall any concerns about liability as well.

Another suggestion urged that, in addition to notations on the Foundation's lists of certified products, that notices be sent to industry and user publications, particularly to those where headgear are advertised.

The purpose of all of this is to stimulate proper quality assurance at the helmet factories with a minimum of interference to those manufacturers who are always in compliance. Manufacturers who always do well in RST will be largely unaffected. Those who do not must either improve or they will find Snell certification impossibly burdensome.

The directors will take up this matter at their April board meeting and enact new non-compliance policies. It is expected these policies will include, in one form or another, many of the ideas discussed here. Comments and opinions are invited.



New Labeling Requirement

The directors are considering a new labeling requirement. Occasionally, a helmet is brought in for random sample testing under brand and model names that we've never heard before. The only familiar aspect of these mystery helmets is the Snell certification label. Although we can

identify the manufacturer, we must usually resort to FAXes, phone calls and e-mail to determine the original model name under which the helmet was certified.

For this reason, the staff here has asked the directors to consider that every Snell certified helmet bear a ♦Certification I.D.♦ on one of its labels that identifies the specific test by which the units were certified. This I.D. consists of nine characters identifying the lab, test number and year of the testing. It is the same I.D. that appears in the lower right hand corner of each Snell Certificate that is prepared and sent out each time a set of helmets passes certification testing.

This proposal will also be written up and sent out for review before it is adopted and a date set for its implementation.



250 Joule Single Impact Capability

The Foundation♦s SA2000 and M2000 Standards call out test impacts of 150 joules followed by a second impact at 110 joules. Although some of the crashed helmets seen here show signs of multiple impacts, many experts seem to doubt whether a helmet should be required to withstand more than a single impact and question the validity of the two impact test protocol. In fact, the two impact protocol probably was established because current test gear cannot easily apply all the impact severity necessary in a single test. The drop height required for a 150 joule drop plus all the allowances for friction and clearances uses most all of the ceiling height in standard commercial buildings.

Snell applies two impacts because the limitations of test gear at most labs prevent applying all the impact severity in one, single impact. The two successive Snell impacts demonstrate that the helmet can manage appreciably more than the 150 joules applied in the first impact although almost certainly not as much as 260 joules, the sum of the two Snell impacts. Which raises an interesting question: Just how severe a single impact might a Snell certified helmet manage? This question is made even more interesting by the Transport Research Laboratory♦s proposal that auto racing headgear be required to withstand single impacts at 10 m/sec which works out to 250 joules.

To answer the question and to respond to the TRL proposal we♦re raising the roof above two of our test stands. We expect have a realizable drop height on the order of 6 meters for a maximum single impact on the order of 280 joules or so. We expect to be ready to do some research drops within a few weeks. We hope to establish what sorts of results Snell Certified manufacturers might expect in testing under the TRL protocol as well as whether the current test hardware can stand up to the additional stresses of this higher energy testing.

However, we have no plans for switching M2005 or SA2005 to single impact protocols. Even if we find that we can perform these impacts economically and safely, we cannot reasonably

anticipate the effect of such a change on the industry and on motorcycle and auto racing headgear. The Foundation has applied two impacts ever since the first Snell standard in 1959. If single impacts are a good idea, they will still be a good idea in 2010.



Children's Motorsports Headgear Symposium

The Foundation is working with the Children's Hospital of Philadelphia to organize a symposium for early April directed towards children's needs in motor sports headgear. The intent is to bring together a group of experts to hammer out a list of recommendations and requirements for headgear for children based on their age ranges, sizes, weights and so on.

The organizers hope to base the invitations on regional and institutional considerations in order to get the participation of as wide a range of thought and experience as possible.



FIM Helmet Standard

The Foundation has been cooperating with the Federation Internationale Motocycliste (FIM) to draft requirements for a new FHS motorcycle helmet standard that would be required for crash helmets worn in FIM championship events. This first standard would likely serve as a template for other, event specific FHS requirements that would eventually apply to all FIM competition.

This first FIM helmet standard is intended to apply to helmets for street use as well as competition racing. However, street use implies EC 22/05 qualification in Europe, DOT qualification in the US and JIS 8133-2000 qualification in Japan. M2000 can coexist with DOT, there are many helmets that fulfill both. Since JIS 8133-2000 appears quite similar to DOT, it is likely that a helmet can also be made to M2000 and Japanese street requirements as well but, presently, I know of no M2000 certified helmet that will also meet EC 22/05. The nature of the impact requirements and the test criteria are very different.

The Snell M2000 test impacts are much more severe than in EC 22/05. Snell applies two impacts at each test site, the first at an impact velocity of 7.74 meters per second and the second at an impact velocity of 6.6 meters per second. The single EC 22/05 impact is at 7.5 meters per second. Although the headform masses are such that the European impact is more severe than the first Snell impact for the two largest headform sizes, XXL and XXXL respectively, they are substantially less than the other three headforms covering the medium and smaller sizes.

Furthermore, the European free drop protocol and the anvil shapes assure that the tests are much less severe than impact energy comparisons might imply.

EC 22/05 limits the shock transmitted through to the test headform to 275 g and limits the HIC to 2400. HIC is the Head Injury Criterion, it is the average shock in g♦s over any time period in the shock recording raised to the 2.5 power times the duration of the time interval. However, HIC was developed for evaluating the outcome of bareheaded impacts into padded automobile interiors. The limit HIC value considered to be safe is 1000. There is considerable doubt whether HIC should be applied to helmeted impacts at all.

The effects of these differences between Snell and EC 22/05 is that Snell qualified helmets will have difficulty meeting EC requirements in flat impacts applied to the crown of the helmet while EC qualified helmets will be overwhelmed by the second Snell impact particularly against the hemispherical anvil. These differences imply that if FIM bases its standard on either one of these two, that helmets qualified to the other may well be eliminated from consideration.

One solution under consideration would be to establish two sets of criteria, one based on Snell M2000 and the other on EC 22/05. Helmets worn in FIM championship events would be required to meet one or the other but not necessarily both. If this solution is adopted, it is expected that FIM would impose other tests and requirements in addition to those of the base standards.

This solution is far from ideal. Since the needs of the riders and the hazards imposed by the event are assumed to be the same, two distinct helmet configurations should not be necessary to assure safety. Although we maintain that Snell certification demonstrates superior protective capability, however, the European Helmet Manufacturers Association holds similarly for EC 22/05. The only clear considerations remaining are commercial and legal. Snell certified motorcycle helmets are manufactured in great numbers and sold for street use throughout the United States and Canada and likely qualify for street use in Japan. EC 22/05 helmets are manufactured in great numbers and are legal for street use throughout Europe. Until there is a single world standard for street motorcycle headgear there may be no single world standard for competition motorcycle headgear.



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