DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket No. NHTSA–2011–0050]

RIN 2127–AK15

Federal Motor Vehicle Safety Standards; Motorcycle Helmets

AGENCY: National Highway Traffic Safety Administration (NHTSA), DOT.

ACTION: Final rule.

SUMMARY: This final rule amends the Federal motor vehicle safety standard that specifies performance requirements for motorcycle helmets to reduce traumatic brain injury and other types of head injury. Some of the amendments will help to increase the benefits of that standard by making it easier for State and local law enforcement officials to enforce State laws requiring the use of helmets meeting that standard. Some motorcyclists use noncompliant helmets known as novelty helmets. These helmets are not certified to the agency's helmet standard and have been shown in testing to fail all or almost all of the safety performance requirements in that standard. Some novelty helmet users attempt to make their helmets appear to law enforcement agencies and the courts to be compliant by misleadingly attaching labels that have the appearance of legitimate "DOT" certification labels. This final rule revises the existing requirements for the "DOT" certification label and other labels and adds new requirements to make it more difficult to label novelty helmets misleadingly.

The other amendments will aid NHTSA in enforcing the standard by setting reasonable tolerances for certain test conditions, devices and procedures. Specifically, this final rule sets a quasi-static load application rate for the helmet retention system; revises the impact attenuation test by specifying test velocity and tolerance limits and removing the drop height test specification; provides tolerances for the helmet conditioning specifications and drop assembly weights; and revises requirements related to size labeling and location of the DOT symbol.

DATES: The final rule is effective May 13, 2013. The incorporation by reference of certain publications listed in the rule is approved by the Director of the Federal Register as of May 13, 2013.

Petitions for Reconsideration: If you wish to submit a petition for reconsideration of this rule, your petition must be received by June 27, 2011.

ADDRESSES: Petitions for reconsideration should refer to the docket number above and be submitted to: Administrator, National Highway Traffic Safety Administration, 1200 New Jersey Avenue, SE., Washington, DC 20590.

See the **SUPPLEMENTARY INFORMATION** portion of this document (Section V; Rulemaking Analyses and Notices) for DOT's Privacy Act Statement regarding documents submitted to the agency's dockets.

FOR FURTHER INFORMATION CONTACT: For non-legal issues, you may call Ms. Shashi Kuppa, Office of Crashworthiness Standards (Telephone: 202–366–6206) (Fax: 202–366–7002). For legal issues, you may call Mr. Steve Wood, Office of the Chief Counsel (Telephone: 202–366–2992) (Fax: 202–366–3820). You may send mail to both of these officials at National Highway Traffic Safety Administration, 1200 New Jersey Avenue, SE., Washington, DC 20590.

SUPPLEMENTARY INFORMATION:

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I. Executive Summary

a. Background

The National Highway Traffic Safety Administration (NHTSA) is very concerned about the sharp and steady increases in injuries and fatalities among motorcyclists that occurred prior to the current recession. Beginning with 1998, motorcycle rider fatalities increased every year through 2008. They more than doubled, according to the Fatality Analysis Reporting System (FARS), from 2,116 deaths in 1997 to 5,290 deaths in 2008.[1] These increases are all the more significant because the total number of deaths involving all types of motor vehicle occupants remained fairly unchanging during most of that time and then began declining in 2007.

This means that motorcycle occupant deaths were also steadily increasing as a percentage of all motor vehicle occupant deaths. In 2008, motorcycle fatalities accounted for 14 percent of all traffic fatalities.[2] This total is particularly concerning given the fact that motorcycles make up less than 3 percent of all registered vehicles in the United States, and account for only 0.4 percent of all vehicle miles traveled.[3]

Over the past decade, the age group with the largest increase in motorcyclist fatalities (from 760 in 1998 to 2,687 in 2008) was not the under 21 age group, the only group covered by the motorcycle helmet use laws of many states, but the 40-and-older age group.[4] The 40-and-older age group accounted for half of the total motorcycle fatalities in the United States that year.

While 2009 FARS data indicate that deaths among motorcyclists and other categories of highway users decreased in 2009, the agency is concerned that the current death toll remains far above the level in 1997. Further, the 2009 reductions seem likely in large measure to be temporary as they coincide with the current recession with its attendant heightened levels of unemployment.[5]

To reduce motorcyclist deaths from traumatic brain injury and other types of head injury, NHTSA long ago (1973) issued Federal Motor Vehicle Safety Standard (FMVSS) No. 218, "Motorcycle helmets." This standard specifies performance (*e.g.,* energy attenuation, penetration resistance, and retention system (chin strap) structural integrity) and labeling requirements for on-road motorcycle helmets. The safety value of those requirements is shown by NHTSA's research finding that wearing a helmet certified as conforming to the FMVSS No. 218 reduces the risk of dying in a motorcycle crash by 37 percent.[6]

However, not all of the helmets worn by motorcycle riders are FMVSS No. 218-compliant. NHTSA estimates that a significant portion[7] of riders wear so-called "novelty" helmets when riding, despite warnings that those helmets are not safe for on-road use. When NHTSA tested these novelty helmets under FMVSS No. 218, the agency found that they failed all or almost all of the safety performance requirements in the standard.[8] Based on these tests, the agency concluded that novelty helmets will not protect motorcycle riders during a crash from either impact or penetration threats, and will not likely be retained on motorcycle riders' heads during crashes.

Some sellers and users of novelty helmets take advantage of the very simple design of the current certification label, which merely bears the letters "DOT," to create the superficial appearance of a FMVSS No. 218-compliant helmet. Various individuals and organizations sell or distribute labels bearing the letters "D.O.T.," claiming that those letters stand for something other than "Department of Transportation" and that the labels only coincidentally closely resemble legitimate certification labels. Examples of online sellers of these misleading labels can readily be found through Internet searches. People who obtain these labels can simply attach them to their novelty helmets to create the appearance of compliant helmets. As a result, they impair the ability of State and local law enforcement officials to establish probable cause for stopping motorcyclists and to prove violations of their State motorcycle helmet use laws.

On October 2, 2008,[9] NHTSA published a notice of proposed rulemaking (NPRM) in the **Federal Register** proposing to amend FMVSS No. 218 to address these and other issues. The notice proposed several changes to encourage the use of compliant helmets, require more informative certification labels (thereby making the production of misleadingly similar labels more difficult), and improve testing procedures for better enforcement of the performance requirements.

Specifically, we proposed enhancements to the certification label (attached to the helmet exterior), such as including the manufacturer's name, the

[1] See Final Regulatory Evaluation (FRE), which is in the docket for this rulemaking action.

[2] "Determining Estimates of Lives and Costs Saved by Motorcycle Helmets," Traffic Safety Facts Research Note March 2011 DOT HS 811 433, available at *http://www-nrd.nhtsa.dot.gov/Pubs/811433.pdf.* (Last accessed March 16, 2011).

[3] Ibid.

[4] Ibid.

[5] Longthorne, Anders, Subramanian, Rajesh and Chen, Chou-Lin, "An Analysis of the Significant Decline in Motor Vehicle Traffic Fatalities in 2008," pp. 1–2 and 15–17, DOT HS 811 346 June 2010. Available at *http://www-nrd.nhtsa.dot.gov/Pubs/811346.pdf:*

In the past, similar significant declines in fatalities were seen during the early 1980s and the early 1990s. Both of these periods coincided with significant economic recessions in the United States. During both these time periods, fatalities in crashes involving younger drivers (16 to 24) declined significantly as compared to drivers in the other, older age groups. Both of these periods of traffic fatality decline were followed by periods of increasing fatalities and the magnitude of the increase was the greatest in crashes involving the younger drivers. This trend was also observed in multiple-vehicle fatal crashes. However, during each period of increase following a period of decline, the annual fatality counts did not rise back to the level they were at prior to the decline.

Pp. 1–2.

[6] Motorcycle Helmet Effectiveness Revisited, March 2004, DOT HS 809 715, Technical Report, National Center for Statistics and Analysis, NHTSA.

[7] In 2010, 54 percent of motorcyclists wore a FMVSS No. 218-compliant helmet, 14 percent wore novelty helmets, and 32 percent wore no helmet at all. These figures represent a significant reduction in FMVSS No. 218-compliant helmet use compared to 2009 when the comparable figures were 67 percent, 9 percent and 24 percent. (2010 figures from "Motorcycle Helmet Use in 2010—Overall Results," Traffic Safety Facts Research Note December 2010 DOT HS 811 419, available at *http://www-nrd.nhtsa.dot.gov/Pubs/811419.pdf.* 2009 figures from Traffic Safety Facts Research Note December 2010 DOT HS 811 254, available at *http://www-nrd.nhtsa.dot.gov/Pubs/811254.pdf.*) This reduction in FMVSS No. 218-compliant helmet use is especially significant in the jurisdictions (20 States and the District of Columbia) with universal helmet use laws where the use of compliant helmets dropped from 86 percent in 2009 to 76 percent in 2010 and the use of novelty helmets increased from 11 percent in 2009 to 22 percent in 2010. This 11 percentage point increase in novelty helmet use in jurisdictions with universal helmet use laws between 2009 and 2010 is evidence of the difficulty encountered by law enforcement officials in enforcing helmet use laws.

[8] "Summary of Novelty Helmet Performance Testing," Traffic Safety Facts Research Note, April 2007 DOT HS 810 752. Available at *http://www.nhtsa.gov/DOT/NHTSA/Traffic%20Injury%20Control/Studies%20&%20Reports/Associated%20Files/Novelty_Helmets_TSF.pdf.*

[9] 73 FR 57297, Docket NHTSA–2008–0157.

model number, and the term "certified" on the label, to make more difficult protestations of innocent intent in producing, selling and attaching labels that misleadingly resemble legitimate certification labels. We also proposed that a clear coating be applied over the certification label. We proposed that information on the discrete size of the helmet, as opposed to a simple general size designation such as "small" or "large," be included on the information and instruction label (typically attached to the helmet interior). Finally, we also proposed slight changes to some of the test specifications in order to aid NHTSA's enforcement efforts.

b. Summary of Final Rule and Differences Between Final Rule and NPRM

After having considered the more than 160 public comments on the NPRM, the agency is publishing this final rule. It adopts many of the proposals in the NPRM, with some differences. As the NPRM proposed, the final rule will:

- Require an enhanced certification label, which will bear the manufacturer's name and helmet model, as well as the word "Certified." [10] We believe that this will discourage the production, sale and attachment of labels that misleadingly resemble legitimate certification labels and thereby facilitate the enforcement of State helmet use laws. This effect will be strengthened if the States make it clear that their requirements to use helmets that comply with Standard No. 218 include the requirement that the helmets bear a label affixed by the helmet manufacturer. This effect will be further strengthened if the States decide that, at some appropriate point in the future after the implementation of the new certification label requirements, only helmets bearing the new certification labels will be considered compliant.
- Permit the certification label to be located on the helmet exterior between 1 and 3 inches (2.5 to 7.6 centimeters (cm)) from the lower rear edge of the helmet, instead of the current limit of between 1⅛–1⅜ inches (2.9–3.5 cm), increasing manufacturer flexibility in label placement.
- Require that the size label state the helmet size in discrete, numerical terms, instead of generally stating that the helmet is "small," "medium," or "large," for example.
- Amend the test procedure for the retention system by specifying a load application rate of 0.4 to 1.2 inches per minute (1–3 cm per minute), and recharacterizing it as a quasi-static test, instead of a static test. Specifying the application rate will aid enforceability of the standard.
- Amend the impact attenuation test by specifying a test velocity and tolerance limits to the test velocity (although the final tolerances have been altered from those proposed in the NPRM) and removing the drop height specification, which is not needed given the new specifications.
- Define "impact site" and clarify the meaning of "identical impacts" for the impact attenuation tests.
- Adopt helmet conditioning tolerances (although one of the final tolerances has been altered from that proposed in the NPRM).
- Update the reference to Society of Automotive Engineers (SAE) Recommended Practice J211, "Instrumentation for Impact Test—Part 1—Electronic Instrumentation," to use a more current version, as well as fix a clerical error where Figures 7 and 8 were inadvertently swapped.

While NHTSA has made some changes to what it proposed in the NPRM, we believe that these changes are relatively minor, and note that they were made in response to reasoned arguments in the comments. The most significant differences between the NPRM and the final rule involve the labeling requirement.

As one measure to discourage the producing and attaching of labels that misleadingly resemble legitimate certification labels, the agency had proposed requiring the application of a clear coating to the exterior shell of a FMVSS No. 218-compliant helmet after the manufacturer attached a valid certification label to it. The agency believed that such a measure would make it more difficult for a non-manufacturer to attach a label that misleadingly resembles a certification label to a novelty helmet and attempt to pass the helmet off as a compliant helmet.

However, commenters responded to the clear coating proposal with three counter-arguments that the agency found convincing. First, commenters stated that such a requirement would not pose a significant obstacle to attaching a misleading label since a post-manufacture clear coat could be readily applied to most helmets by anyone. Second, commenters stated that a clear coating requirement was incompatible with certain helmet designs, including those with matte finishes or cloth or leather exteriors. Third and finally, the commenters submitted information indicating that many helmets with solid exterior colors such as white, red, and yellow, are not manufactured with clear coating. Requiring clear coating for these helmets would cost significantly more than the agency originally believed ($0.60 to $1.00 per helmet compared to the $0.02 that the agency estimated). The agency found merit in these arguments and accordingly has not included the clear coat requirement for any helmets in the final rule. Nonetheless, we believe that the requirements we have adopted for improved labeling will help to deter the attaching of misleading labels to helmets even without the adoption of the clear coat proposal.

Other differences between the NPRM and final rule are listed below, and are explained in detail in the later sections of this preamble:

- In response to comments, the final rule adds the term "FMVSS No. 218" between "DOT" and "Certified" on the certification label. The addition clarifies that what is being certified is a helmet's compliance with the standard.
- The final rule modifies the proposed definition of "impact site" for the anvil test as the point on the helmet where the falling helmet shell first contacts the test anvil during the impact attenuation test. We believe that this change will reduce any current potential for misinterpretation of the test requirements.
- This final rule narrows the specified velocity tolerance ranges for the impact attenuation tests in response to comments. The final values are 16.4 feet/second (ft/s) to 17.7 ft/s (5.0 to 5.4 meters/second (m/s)) on the hemispherical anvil, and 19.0 ft/s to 20.3 ft/s (5.8 to 6.2 m/s) on the flat anvil (a tolerance of ± 7.9 inch/second (in/s) (± 0.2 m/s) for each test). Several commenters argued that the proposed tolerance levels of 15.8 in/s (0.4 m/s) resulted in potentially up to 30 percent energy variation, which could cause some helmets to fail the impact attenuation requirements. The final tolerance levels permit much less variation, but are still within the capability limits of common test equipment.
- The final rule adds a test tolerance of ± 0.22 pound (lb) (± 0.1 kilogram (kg)) for the drop assembly weights for all headform sizes, as part of our efforts to improve test procedures. These tolerances will provide test laboratories with a slight measure of leeway on their headform weights and will aid

[10] As noted below, the final rule also adds the term "FMVSS No. 218" between "DOT" and "Certified" on the certification label.

enforceability of the standard. The final rule adds test tolerances for the penetration test parameters (drop height) and striker properties (striker mass, striker point included angle, cone height, and tip radius).

• The final rule also changes the ranges for helmet conditioning time, allowing helmets to be conditioned for periods of between 4 and 24 hours. It will also allow indefinite conditioning time for the ambient condition. These changes will allow helmets to be conditioned during normal business hours as well as prevent indefinite conditioning for non-ambient conditions.

NHTSA believes that the effect of these changes will be to improve significantly the enforceability of the helmet standard, specify clearer instructions for compliance laboratories, as well as help to reduce the number of novelty helmets being used by motorcycle riders. We believe that these changes will, in turn, increase the effectiveness of the standard and produce important safety benefits at marginal costs to legitimate, reputable helmet manufacturers, as summarized in the next section.

c. Estimated Benefits and Costs

The benefits and costs of the rule would depend on how many motorcycle riders will change from using novelty helmets to FMVSS No. 218-certified helmets. Behavior change among motorcycle riders as a result of the rule is difficult to predict. However, the agency believes that 5 to 10 percent of the novelty helmet users in States that have a universal helmet use law would make a switch, and that this is a modest and achievable projection. Therefore, the agency estimated benefits and costs of the rule for the 5 and 10 percent projected switch from novelty helmet to compliant helmet use.

The total equivalent lives saved ranges from a low estimate of 22 lives (scenario where 5 percent of the riders convert from novelty helmets to compliant helmet use) to a high estimate of 75 lives (scenario where 10 percent of the riders convert from novelty helmets to compliant helmet use). The costs come from two sources—the direct increased costs of labeling for manufacturers due to the improved certification label requirements, and the indirect cost to motorcyclists, in States with helmet use laws, of replacing a novelty helmet with a FMVSS No. 218-compliant motorcycle helmet.

We believe that the additional labeling costs are extremely low. We estimate the marginal cost difference between the old certification labels and the new ones to be approximately 2 cents per helmet. As approximately 5.2 million helmets are sold annually, we expect the industry-wide effect of this increase to be $0.1 million.

A greater cost will be incurred if a motorcycle rider, as a result of this rule, discards a novelty helmet and purchases a new FMVSS No. 218-compliant helmet. We estimate the average difference in cost between a new compliant helmet and a new novelty helmet to be $46.02. The total costs range from $2.2 million (if 5 percent of these riders convert to compliant helmets) to $4.3 million (if 10 percent convert). The commonly-used metric of net costs per equivalent life saved (NCELS) ranges from $63,763 to $130,586 for the scenario when 5 to 10 percent of the riders convert to compliant helmets. These figures are very low compared to the figure of $6.31 million currently used by the agency to justify issuance of a rule.

II. Background and Notice of Proposed Rulemaking

a. Background

1. Motorcycle Fatalities

A. There Were 11 Consecutive Years of Motorcycle Fatality Increases Beginning in 1998

There is a pressing need for improvements in motorcycle safety. For eleven straight years, from 1998 through 2008, motorcycle rider fatalities increased every year. Fatalities more than doubled in that time, according to FARS, from 2,116 deaths in 1997 to 5,290 deaths in 2008. In 2006, motorcycle rider fatalities exceeded the number of pedestrian fatalities for the first time since NHTSA began collecting fatal motor vehicle crash data in 1975, and in 2009 accounted for 13 percent of all annual motor vehicle fatalities.

A number of explanations have been offered for the steady increase from 1998 through 2008, including increases in motorcycle sales, increases in the percentage of older riders, and increases in engine size. However, as shown in research by NHTSA's National Center for Statistics and Analysis (NCSA) [11] and discussed in the Final Regulatory Evaluation (FRE), the increase in the number of deaths resulting from motorcycle crashes has been disproportionately large and fast compared to the increases in the number of motorcycles on the road and the distance they are driven. In 2007, motorcycles accounted for only about 3 percent of all registered vehicles and 0.4 percent of all vehicle miles traveled (VMT), but accounted for 14 percent of all traffic crash fatalities in 2008, compared to 5 percent in 1997. This represents a significant increase in their proportion of the annual loss of life in traffic crashes. In recent years, fatality rates for motorcycle riders have increased faster than the increase in motorcycle exposure (VMT on motorcycles as well as the number of registered motorcycles). The number of fatalities per 100 million VMT on motorcycles has almost doubled, increasing from 21 in 1997 to 38 in 2007.[12] Similarly, the number of fatalities per 100,000 registered motorcycles increased from 59 in 1998 to 72 in 2007. Compared with a passenger car occupant, a motorcycle rider is 37 times more likely to die in a crash and 9 times more likely to be injured, based on VMT.[13]

The National Transportation Safety Board (NTSB) has also made a similar assessment of the motorcycle safety problem. The assessment appeared in a safety alert, "Motorcycle Deaths Remain High," issued in November 2010, and included the following findings:[14]

• Deaths from motorcycle crashes have more than doubled in the past 10 years—from 2,294 in 1998 to 5,290 in 2008—an alarming trend. Another 96,000 people were injured in motorcycle crashes in 2008.

• The yearly number of motorcycle deaths is more than double the annual total number of people killed in all aviation, rail, marine and pipeline accidents combined.

• Head injuries are a leading cause of death in motorcycle crashes.

B. There Were Sharp Decreases in 2009 in All Categories of Motor Vehicle Fatalities, Including Motorcycle Fatalities

In 2009, overall traffic fatalities fell by almost 10 percent compared to 2008. Occupant fatalities fell by 11 percent in passenger cars, almost 5 percent in light trucks, 26 percent in large trucks and 16 percent on motorcycles. In addition, fatalities fell by 7.3 percent for pedestrians and 12 percent for pedalcylists.

[11] Traffic Safety Facts, 2008 Data—Motorcycles, DOT HS 811 159, National Center for Statistics and Analysis, NHTSA.

[12] The Federal Highway Administration (FHWA) recognizes the need to improve the accuracy of their VMT estimate for motorcycles and is currently implementing new requirements for motorcycle VMT data.

[13] Traffic Safety Facts, 2008 Data—Motorcycles, DOT HS 811 159.

[14] Available at *http://www.ntsb.gov/alerts/SA_012.pdf.*

C. Motorcycle Training Is an Unlikely Cause for the Sudden Decline in Motorcycle Fatalities

Some commenters suggested that motorcyclist training produced the decline. This explanation for the decline seems highly questionable. As explained below in the discussion of NHTSA's comprehensive motorcycle safety plan, the results of studies of such training are mixed as to whether the training has any measurable effect on fatalities. In addition, even if the results were not mixed and instead uniformly demonstrated that training had a significant effect on fatalities, there is no indication that there has been a recent substantial increase in the number of trained motorcyclists that could explain the sudden significant decline in motorcycle fatalities.

D. The 2009 Fatalities Decreases Coincided With the Current Recession

The more likely explanation can be found in the fact that the relatively sudden, significant and almost across-the-board declines in all categories of traffic fatalities coincide with the current recession.[15]

E. The Two Other Sharp Decreases in Motor Vehicle Fatalities in the Last 35 Years Also Coincided With Recessions and Were Mostly Temporary

There have been three periods, including the current one, since the early 1970's in which there were the most significant across-the-board declines in overall traffic fatalities. The declines coincided with the three most significant recessions since the early 1970's. After the first and second recessions, the overall number of fatalities rebounded to nearly the pre-recession levels. The agency anticipates that fatalities will likewise rebound this time. Thus, the agency remains concerned about the trend in motorcycle death totals in future years.

F. Regardless of the 2009 Decreases and the Reasons for Those Decreases, Motorcycle Fatalities Remain Far Above the 1997 Levels

The essential facts are that motorcycle fatalities remain far above the 1997 levels and that use of motorcycle helmets is the single most effective way of preventing motorcyclist fatalities.

2. Motorcyclist Head Injuries

The main function of motorcycle helmets is to reduce injuries to the head and, especially, the brain. Brain injury is more likely to result in expensive and long-lasting treatment, sometimes resulting in lifelong disability, while other head injuries, concussions and skull fractures (without damage to the brain itself), are more likely to result in full recovery.[16]

3. NHTSA's Comprehensive Motorcycle Safety Plan and the Indispensable Role Played by Helmet Use

A. Haddon Matrix and Motorcycle Safety Program Planning

NHTSA's comprehensive motorcycle safety program[17] seeks to: (1) Prevent motorcycle crashes; (2) mitigate rider injury when crashes do occur; and (3) provide rapid and appropriate emergency medical services response and better treatment for crash victims. As shown in Table 1 below, the elements of the problem of motorcycle fatalities and injuries and the initiatives for addressing them can be systematically organized using the Haddon Matrix, a paradigm used for systematically identifying opportunities for preventing, mitigating and treating particular sources of injury. As adapted for use in addressing motor vehicle injuries, the matrix is composed of the three time phases of a crash event (I-Crash Prevention—Pre-Crash, II-Injury Mitigation—During a Crash, and III-Emergency Response—Post-Crash), along with the three areas influencing each phase (A-Human Factors, B-Vehicle Role, and C-Environmental Conditions).

Effectively addressing motorcyclist head injuries or any other motor vehicle safety problem requires a multi-pronged, coordinated program in all of the areas of the Haddon matrix, as shown in Table 1. As no measure in any of the nine areas is a panacea or even remotely approaches being one, the implementation of a measure in one area does not eliminate or reduce the need to implement measures in the other areas.

B. Training's Place in the Matrix; Not a Substitute for Helmet Use

For example, while NHTSA encourages efforts in all areas of the motorcycle safety matrix below, including the offering of training for motorcyclists, such training cannot substitute for the wearing of helmets complying with FMVSS No. 218. This is particularly true because the results of studies regarding the effectiveness of such training in actually reducing crash involvement are, at best, mixed.[18] To use an example more closely related to the experiences of most people who travel on the Nation's roadways, arguing that taking a motorcycle operating course eliminates the need for using motorcycle helmets is akin to arguing that taking a driver's education course for driving a passenger vehicle eliminates the need for people to use seat belts or to place children in safety seats or even for vehicle manufacturers to install seat belts, air bags, padding and other safety equipment and features in motor vehicles.

TABLE 1—NHTSA'S MOTORCYCLE SAFETY PROGRAM[19]

	A-Human factors	B-Vehicle role	C-Environmental conditions
I-Crash Prevention (Pre-Crash)	• Rider Education & Licensing. • Impaired Riding. • Motorist Awareness. • State Safety Program.	• Brakes, Tires, & Controls. • Lighting & Visibility. • Compliance Testing & Investigations.	• *Roadway Design, Construction, Operations & Preservation.* • *Roadway Maintenance.* • Training for Law Enforcement.

[15] Longthorne, Anders, Subramanian, Rajesh and Chen, Chou-Lin, "An Analysis of the Significant Decline in Motor Vehicle Traffic Fatalities in 2008," DOT HS 811 346 June 2010. Available at *http://www-nrd.nhtsa.dot.gov/Pubs/811346.pdf.*

[16] NHTSA, Benefits of Safety Belts and Motorcycle Helmets, Report to Congress, February 1996.

[17] The program can be found at *http://www.nhtsa.gov/DOT/NHTSA/Communication%20&%20Consumer%20Information/Articles/Associated%20Files/4640-report2.pdf.* See also Countermeasures that Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices, Fifth Edition, pp. 5–1 through 5–28, DOT HS 811 258, January 2010.

[18] Office of Behavioral Safety Research, National Highway Traffic Safety Administration, Approaches to the Assessment of Entry-Level Motorcycle Training: An Expert Panel Discussion, DOT HS 811 242, March 2010. *http://www.nhtsa.gov/staticfiles/nti/motorcycles/pdf/811242.pdf.* The report concluded:

While basic rider courses teach important skills, the effectiveness of training as a safety countermeasure to reduce motorcycle crashes is unclear. Studies conducted in the United States and abroad to evaluate rider training have found mixed evidence for the effect of rider training on motorcycle crashes.

[19] Activities shown in italics are either implemented jointly with, or conducted by, the Federal Highway Administration.

TABLE 1—NHTSA'S MOTORCYCLE SAFETY PROGRAM [19]—Continued

	A-Human factors	B-Vehicle role	C-Environmental conditions
II-Injury Mitigation (Crash)	• Use of Protective Gear.	• Occupant Protection.	• *Roadway Design, Construction, & Preservation.*
III-Emergency Response (Post-Crash).	• Automatic Crash Notification.	• Education & Assistance to EMS. • Bystander Care. • Data collection & analysis.	

C. Key Contributions by Helmets

Mitigating rider injury in crashes through the use of motorcycle helmets is a highly effective measure for improving motorcycle safety. The steadily increasing toll of motorcyclist fatalities would have been significantly lower had all motorcyclists been wearing motorcycle helmets that meet the performance requirements issued by this agency. In potentially fatal crashes, helmets have an overall effectiveness of 37 percent in preventing fatalities.[20] Based on the data for 2008, the agency estimates that helmets saved 1,829 lives in that year. If there had been 100 percent helmet use among motorcycle riders, an additional 823 lives could have been saved that year.[21]

Again, in its November 2010 Safety Alert, the NTSB came to similar conclusions about the value in increasing the use of helmets that comply with FMVSS No. 218:

• DOT-compliant helmets are extremely effective. They can prevent injury and death from motorcycle crashes.

• If you are in a crash without a helmet, you are three times more likely to have brain injuries.

• Wearing a helmet reduces the overall risk of dying in a crash by 37%.

• In addition to preventing fatalities, helmets reduce the need for ambulance service, hospitalization, intensive care, rehabilitation, and long-term care.

• Wearing a helmet does not increase the risk of other types of injury.

The value of helmet use can be demonstrated in other ways. Data from the agency's Fatality Analysis Reporting System (FARS) for the period 1995–2004 also show the importance of motorcycle helmet use. Even though the percentage of riders who use motorcycle helmets is larger than the percentage of riders who do not, non-users suffer more fatal head injuries. For example, from 2000 to 2002, an average of 35 percent of helmeted riders who died suffered a head injury, while an average of 51 percent of the non-users who died suffered a head injury.[22]

D. Motorcyclists Who Either Wear Noncompliant Helmets or Do Not Wear Any Helmet

Unfortunately, a significant percentage of motorcyclists either wear noncompliant helmets or do not wear any helmet at all. In 2009, 20 States and the District of Columbia had universal helmet use laws, *i.e.,* ones requiring all motorcyclists to wear helmets. In those 21 jurisdictions, FMVSS No. 218-compliant helmets were used by 86 percent of motorcyclists; noncompliant helmets were used by 11 percent of motorcyclists; and no helmets were used by an estimated 3 percent of motorcyclists. Comparatively, in the 30 States with partial [23] or no helmet use laws, only 55 percent of motorcyclists used FMVSS No. 218-compliant helmets; 8 percent used noncompliant helmets; and 37 percent did not use a helmet at all.[24] These data are presented below in tabular form:

TABLE 2—MOTORCYCLE HELMET USE RATES IN 2009

Motorcyclists	States with a universal helmet use law	States with partial or no helmet use law
Percentage using FMVSS No. 218-compliant helmets	86	55
Percentage using noncompliant helmets	11	8
Percentage not using any helmet	3	37

In 2010, these figures changed significantly for the worse.[25]

TABLE 3—MOTORCYCLE HELMET USE RATES IN 2010

Motorcyclists	States with a universal helmet Uue law	States with partial or no helmet use law
Percentage using FMVSS No. 218-compliant helmets	76	40
Percentage using noncompliant helmets	22	8

[20] "Motorcycle Helmet Effectiveness Revisited, March 2004, DOT HS 809 715, Technical Report, National Center for Statistics and Analysis, NHTSA.

[21] Ibid.

[22] Rajesh Subramanian, Technical Report: Crash Stats, Bodily Injury Locations in Fatally Injured Motorcycle Riders, National Center for Statistics & Analysis, National Highway Traffic Safety Administration, DOT HS 810 856, October 2007. Available at *http://www-nrd.nhtsa.dot.gov/Pubs/810856.pdf.*

[23] The partial laws typically require helmet use only by persons 17 years of age or younger, even though 70 percent of the teenagers killed on motorcycles are 18 or 19 years of age and even though teenagers of all ages account for only about 4.5 percent of all motorcycle fatalities. Insurance Institute for Highway Safety, Fatality Facts 2008, Teenagers. Available at *http://www.iihs.org/research/fatality_facts_2008/teenagers.html.*

[24] Motorcycle Helmet Use in 2009—Overall Results, Traffic Safety Facts Research Note, DOT HS 811 254.

[25] Motorcycle Helmet Use in 2010, Overall Results, Traffic Safety Facts Research Note, DOT HS 811 419.

TABLE 3—MOTORCYCLE HELMET USE RATES IN 2010—Continued

Motorcyclists	States with a universal helmet Uue law	States with partial or no helmet use law
Percentage not using any helmet	2	52

These data show that a considerable number of motorcyclists both in States with universal helmet use laws and States with partial or no helmet use laws are wearing noncompliant helmets. As briefly discussed immediately below and at greater length under "Enforceability Concerns," such helmets do not provide adequate protection.

The noncompliant helmets are commonly called "novelty" helmets. They are not designed or manufactured for highway use, and lack the strength, energy absorption capability, and size necessary to protect their users. They do not meet the safety requirements of FMVSS No. 218 and are not certified as doing so. In fact, recent compliance test data on novelty helmets showed that they failed all or almost all of the FMVSS No. 218 performance requirements.[26] Manufacturers of these helmets frequently make disclaimers that contend the helmets are not intended for protecting the persons who wear them from injury, despite the fact that helmets for all types of recreational activities (including sporting ones) generally have a protective purpose and the novelty helmets, labeling aside, likewise appear to have a protective purpose. These manufacturers further claim that the helmets are not intended for highway use, despite the fact that the helmets are predictably used precisely and primarily for that purpose. As the above tables show, a significant proportion of motorcyclists use novelty helmets on the highway, especially in states with universal helmet use laws.

3. Enforceability Concerns

This rulemaking seeks to increase the benefits of FMVSS No. 218 in two ways. The first way is improve the exterior certification label to reduce the attaching of labels that misleadingly resemble legitimate certification labels to novelty helmets and encourage more use of compliant helmets and assist State law enforcement officers in enforcing helmet use laws. The second is to add tolerances to the test conditions and procedures and clarify language in the standard. This will provide clear guidance to manufacturers for conducting compliance tests and will increase the ability of the agency to bring successful enforcement actions when a noncompliance is discovered.

A. Novelty Helmets and Enforcement of Helmet Use Laws

In order to reap the benefits of compliant helmets more fully, changes to the labeling requirements are needed to make it easier for State and local law enforcement officials to enforce State motorcycle helmet use laws against motorcyclists using novelty helmets. Novelty motorcycle helmets are not certified by their manufacturers as being compliant with FMVSS No. 218 and in fact offer the wearer little or no protection against injury.[27]

i. Are novelty helmets safe?

No. When NHTSA tested novelty helmets under FMVSS No. 218, the agency found that they failed all or almost all of the safety performance requirements in the standard.[28] Based on these tests, the agency concluded that novelty helmets will not protect motorcycle riders during a crash from either impact or penetration threats. Likewise, their chin straps are incapable of keeping the helmets on the heads of their users during crashes.

ii. How are novelty helmets used in an attempt to avoid being ticketed and fined for violating state requirements to wear a FMVSS No. 218-certified helmet?

Some motorcyclists who wear novelty helmets have been affixing labels bearing the symbol "DOT" to their helmets in order to create the misleading appearance of properly certified, compliant helmets.[29] These labels closely and not simply coincidently resemble the "DOT" certification symbol required by FMVSS No. 218. They can be readily purchased from stores selling novelty helmets or from online retailers. States report that when these motorcyclists are stopped by law enforcement officers, they falsely claim that the label was on their helmet when they bought it and that the label led them to believe that their helmet was certified to FMVSS No. 218. Other motorcyclists do not add a label that misleadingly resembles a legitimate "DOT" certification label to their novelty helmets and instead falsely claim they assumed that there must have been a legitimate certification label on the helmet originally and that that label must have fallen off or been removed by a prior owner.

The ability of novelty helmet users to attach inexpensive, easy-to-produce and easy-to-obtain labels having essentially the same appearance of legitimate certification labels has complicated the efforts of State and local law enforcement personnel to enforce requirements for the use of properly certified helmets. The availability and use of these labels make it difficult for law enforcement officials in States with helmet use laws to determine whether or not a rider is wearing a helmet certified to FMVSS No. 218. The misleading look-alike "DOT" labels make it difficult to prove that a motorcyclist is deliberately flouting helmet use laws by wearing a novelty helmet with a look-alike "DOT" label that falsely suggests the helmet is certified. More importantly, the use of noncompliant helmets puts motorcyclists at much greater risk of head injury or death in the event of a crash.

In some cases, the use of these look-alike labels has enabled motorcyclists either to assert successfully in court that he or she believed in good faith that the helmet he or she was using had been certified to the Federal standard and/or to put State authorities to the time and expense of conducting tests to prove that the helmet is noncompliant. Further, sellers and distributors of these labels, which bear the letters "DOT,"

[26] Summary of Novelty Helmet Performance Testing, Traffic Safety Facts Research Note, DOT HS 810 752.

[27] Compliance test data on novelty helmets showed that they failed almost all of the FMVSS No. 218 performance requirements. (Compliance test results can be found at *http://www-odi.nhtsa.dot.gov/tis/index.cfm*). In fact, in all tests performed by the Office of Vehicle Safety Compliance (OVSC), novelty helmets were found to be inadequate in offering their users even minimal protection during a crash.

[28] "Summary of Novelty Helmet Performance Testing," Traffic Safety Facts Research Note, April 2007 DOT HS 810 752. Available at *http://www.nhtsa.gov/DOT/NHTSA/Traffic%20Injury%20Control/Studies%20&%20Reports/Associated%20Files/Novelty_Helmets_TSF.pdf.*

[29] Using the search term "DOT helmet labels" or "DOT helmet stickers," sellers of these labels can be readily found, for example, on eBay or via Google. Various Web sites also sell novelty helmets with a free DOT label.

attempt to avoid any responsibility for their sale and use. They assert that the labels are not counterfeit or misleading look-alike "certification" labels, but merely labels that coincidentally resemble legitimate "DOT" certification labels and whose letters stand for "Doing Our Thing," not "Department of Transportation." The agency notes its understanding that these look-alike labels appeared only after the implementation of FMVSS No. 218. As a result, application of these labels to noncompliant helmets enables motorcyclists to avoid conviction and penalties in situations in which State and local helmet laws require the use of a certified FMVSS No. 218-compliant motorcycle helmet.

In NHTSA's judgment, the mere presence of a "DOT" label on a helmet that otherwise lacks the construction and appearance of a FMVSS No. 218-compliant helmet cannot reasonably be thought to be indicative that the helmet is a compliant helmet. The plausibility of that indication is negated by the helmet's lack of the visible physical attributes [30] typically possessed by a compliant helmet. The presence of a label on such a helmet is instead actually indicative that the label is a misleading look-alike label applied by a helmet seller or user, not by its manufacturer.

In addition to the enforcement problems, improper use of the "DOT" symbol on noncomplying helmets has the additional undesirable effect of placing legitimate motorcycle helmet manufacturers that responsibly design, test, and certify their helmets to FMVSS No. 218 requirements at a financial competitive disadvantage. Novelty helmets are made of inferior materials and based on inferior designs. Further, they are not subjected by their manufacturers to any testing to assure a suitable level of safety performance.

B. Enforcement of FMVSS No. 218

The other main issue concerns the enforceability of determinations of noncompliance with the performance requirements in FMVSS No. 218. During fiscal year (FY) 2002 and 2003 compliance testing, the agency discovered ambiguities in the language of the impact attenuation test and the retention test when testing helmets manufactured by NexL Sports Products (NexL). NHTSA compliance testing indicated that NexL's helmets failed to meet the performance requirements of FMVSS No. 218 on helmet impact attenuation, penetration, and retention.

In its response to the agency's finding of noncompliance, NexL claimed that the agency's impact attenuation tests were invalid because the agency violated S7.1.4(b) of the standard by testing the helmets at velocities lower than the minimum required 19.7 ft/s (6 m/s). NHTSA found that the helmets did not comply with the impact attenuation requirements of FMVSS No. 218 during agency testing, which is typically conducted at speeds somewhat less than 19.7 ft/s. Because the impact attenuation test, as written, requires a minimum impact speed of 19.7 ft/s, the agency tentatively concluded that there was arguably merit of a technical, not substantive, nature to NexL's arguments [31] and that this language should therefore be clarified.

With regard to the retention test, NexL stated that it tested its helmets at the required static load condition, and that its testing did not result in any displacement failures. In its investigation, NHTSA found that NexL was able to achieve passing results by adjusting the load application rate of the test equipment until a passing displacement result (less than one inch, or 2.54 cm, of displacement) was achieved. In other words, by applying the required tensile load to the helmet at one rate, NexL was able to achieve a passing result, while in a similar test where the load was applied at a different rate, NHTSA results showed a noncompliance. Because the rate of application of the static load was unspecified in the standard, NHTSA decided not to undertake an enforcement action.

b. Notice of Proposed Rulemaking

1. Labeling Revisions to Reduce Misleading Labeling of Novelty Helmets

We proposed three requirements for helmet certification labeling: [32] (1) The application of a FMVSS No. 218 certification label to the helmet beneath a clear coating; (2) lettering on the label indicating the manufacturer's name and/or brand and the helmet model designation in the space above the "DOT" symbol; and (3) the word "certified" in a horizontally centered position beneath the "DOT" symbol on that label.

2. Size Labeling and Location of the "DOT" Certification Label

The agency proposed that helmets be labeled with a "discrete size," which would be used to select the appropriate headform for compliance testing purposes. In addition, the agency proposed that the required certification label on the exterior surface of helmets be positioned such that the horizontal centerline of the DOT symbol is located between one and three inches (2.5–7.6 cm) from the lower edge of the helmet.

3. Retention Test

The agency proposed specifying a load application rate for the retention test of 1.0 to 3.0 cm/min and reclassifying the test as a quasi-static test instead of the current static test.

4. Impact Attenuation Test

NHTSA proposed to specify test velocity and tolerance limits for the impact attenuation test. Specifically, we proposed that the test velocity be any speed between 15.7 ft/s to and including 18.4 ft/s (from 4.8 m/s to and including 5.6 m/s) for the impact on the hemispherical anvil, and any speed from 18.4 ft/s to and including 21.0 ft/s (from 5.6 m/s to and including 6.4 m/s) for the impact on the flat anvil. In addition, we proposed to remove the drop height requirement from the impact attenuation test.

5. Helmet Conditioning Tolerances

NHTSA proposed to set tolerances for the helmet conditioning procedures. For the ambient condition, the range was any temperature from 61 °F to and including 79 °F (from 16 °C to and including 26 °C) and any relative humidity from 30 to and including 70 percent. For the low temperature condition, the range was any temperature from 5 °F to and including 23 °F (from −15 °C to and including −5 °C). For the high temperature condition, the range was any temperature from 113 °F to and including 131 °F (from 45 °C to and including 55 °C). For the water immersion test, the range for the water temperature was from 61 °F to and including 79 °F (from 16 °C to and including 26 °C). In addition, NHTSA proposed that the 12 hour duration be specified as a minimum duration.

[30] Examples of such attributes include adequate thickness and composition of the shock absorbing liner and the presence of the interior label required by FMVSS No. 218. Any layman can determine that a thick liner composed of easily compressed sponge rubber would have no protective value in a crash.

[31] If NexL's helmets fell short of the required level of performance in tests below 19.7 ft/s, they would almost certainly have fallen farther short of that level in tests at 19.7 ft/s, given that the difficulty of compliance increases as speed increases.

[32] There were some discrepancies between the proposals as described in the NPRM preamble and the proposals as set forth in the NPRM regulatory text. For example, the preamble stated that the agency was proposing that the certification label be a water decal and that it be placed under a clear coating. The regulatory text made no mention of a water decal. Also, the preamble proposed one set of tolerances for the water temperature specified in the water immersion procedure and the regulatory text set forth a slightly different set of tolerances.

III. The Final Rule and Responses to Comments

NHTSA received 162 comments in response to NPRM. Three international manufacturers of FMVSS No. 218-compliant motorcycle helmets provided comments: Shoei Co., Ltd (Shoei),[33] Arai Helmet, Limited (Arai),[34] and Shark Helmets (Shark).[35] The agency also received comments from the Motorcycle Industry Council (MIC),[36] a trade association representing manufacturers of, among other things, motorcycles and motorcycle parts and accessories, including many helmet distributors in the United States.

Various organizations with a focus on vehicle or helmet safety and enforcement submitted comments to the docket. One entity that provided extensive information is the Snell Memorial Foundation (Snell),[37] a not-for-profit organization that promotes the development, manufacture, and use of effective helmets for a variety of purposes. NHTSA also received comments from the Washington Association of Sheriffs and Police Chiefs (WASPC),[38] the Governors Highway Safety Association (GHSA),[39] the Insurance Institute for Highway Safety (IIHS),[40] and one independent governmental entity, the NTSB,[41] organizations which generally promote safety and law enforcement interests. The Motorcycle Riders Foundation (MRF),[42] an organization representing interests of some motorcycle riders, also submitted comments.

Finally, this rulemaking action elicited comments from a wide variety of individual commenters expressing personal or professional views, including some anonymous comments. People expressed a wide variety of thoughts to this agency, with many people praising the agency for its efforts to regulate motorcycle helmets, and others questioning the value of such efforts. Where individual comments are discussed in this document, a docket citation for the specific comment is provided.

The following sections address all of the issues raised by the various comments and the agency's response to each of them. While each comment is not discussed individually in this document, we have attempted to group many of the common ideas, questions, and arguments in the comments together and respond to issues as a whole where possible instead of each comment individually.

a. Certification Labeling

One of the central purposes of the proposal to update FMVSS No. 218 was to improve the exterior label in an attempt to reduce the number of motorcyclists who wear novelty helmets. We believe that fewer motorcyclists will use novelty helmets if it is harder to produce and obtain misleading look-alike "certification" labels, and thus harder for novelty helmet users to continue to claim falsely that their helmet bears a valid FMVSS No. 218 certification label and the helmet was sold to them as a FMVSS No. 218-compliant helmet. Further, we believe that improved labels can make it easier for law enforcement officers to identify novelty helmets on the road. Currently, due to the use by novelty helmet users of misleading look-alike "certification" labels, law enforcement officers must try and use other characteristics to determine if a rider is wearing a FMVSS No. 218-compliant helmet. By making the producing and obtaining of misleading look-alike "certification" labels harder, we hope to facilitate State law enforcement.

As stated above, due to the simplicity of the current certification label, it is easy to produce and acquire misleading look-alike "certification" labels. Because the label bears only the letters "DOT," label manufacturers can manufacture them cheaply and in large quantities. The labels are available online, and sometimes available for a nominal or no fee at shops that sell novelty motorcycle helmets. Label manufacturers and label distributors or sellers claim that the labels are merely novelty labels and that DOT stands for "Doing Our Thing." It is also easy for riders to affix a label, as they merely need attach one of these easily-available labels to the outside of their novelty helmet.

The NPRM proposed several elements that would make it more difficult for label manufacturers to manufacture, and novelty helmet users to obtain a misleading look-alike "certification" label. First, we proposed to add the word "Certified" to the label. This, we believed, would eliminate any plausibility to the argument that the "DOT" labels they manufactured are mere novelty labels. Second, we proposed that the label contain the manufacturer's name and model designation. This would require a different certification label for each helmet model, and make manufacture of misleading look-alike "certification" labels far more complicated than merely manufacturing generic "DOT" labels that can be used on any novelty helmet. Third, NHTSA examined a variety of means to make application of the certification label more difficult than merely attaching a label to the exterior of the helmet. In the NPRM, NHTSA examined numerous alternative means of accomplishing this, including using a hologram, embossing the certification onto the helmet, sewing the certification mark on the chinstrap, and applying a clear coating above the certification label. Ultimately, NHTSA proposed regulatory text requiring that the certification label be applied by the manufacturer under a clear coating, believing that this would make it more difficult for end-users to apply misleading look-alike "certification" labels. In addition, it sought comment on adopting the alternatives in the final rule.

1. Addition of the Terms "Certified" and "FMVSS No. 218"

While most commenters supported the addition of the word "Certified" to the certification label, there was some disagreement. On the one hand, many commenters suggested that the addition of the word "Certified" was not enough, and that the agency should also require the addition of some iteration of the term "FMVSS No. 218" to make clear that the label conveys certification of a Federal motor vehicle safety standard. On the other hand, some commenters did not support the change to the label, believing that it would add cost and be of no value to safety.

Some commenters expressed concern that the term "certified" was ambiguous. Shoei commented that introduction of the word "certified" would imply that the Department of Transportation had certified the helmet itself, which would be incorrect, as NHTSA relies on manufacturer self-certification. Shoei stated that, even with just the current label, some customers request to see documentation indicating that the DOT has approved of or certified the helmet. While we sympathize with Shoei, we do not believe that use of a term other than "certified" (*e.g.,* "compliant") would completely eliminate confusion. Other commenters stated that ambiguity could be lessened by a reference to FMVSS No. 218, which could be added to the label in addition to or in lieu of the word "certified." These commenters included IIHS, Arai, and Shark. IIHS stated that a reference to FMVSS No. 218 would deny producers of misleading look-alike "certification"

[33] Docket NHTSA–2008–0157–0160.
[34] Docket NHTSA–2008–0157–0103.
[35] Docket NHTSA–2008–0157–0166.
[36] Docket NHTSA–2008–0157–0156.
[37] Docket NHTSA–2008–0157–0129 and 0164.
[38] Docket NHTSA–2008–0157–0161.
[39] Docket NHTSA–2008–0157–0021.
[40] Docket NHTSA–2008–0157–0157.
[41] Docket NHTSA–2008–0157–0143.
[42] Docket NHTSA–2008–0157–0058 and 0088.

labels the plausible argument that their labels have any other meaning besides referencing and indicating compliance with the Federal standard. Shark and Arai also both stated that a reference to FMVSS No. 218 would better convey the intent of the certification label.

MRF argued against the necessity of adding language to the certification label. It stated that the label is the least important part of the helmet, and that changing it will only force producers of misleading look-alike "certification" labels to become more creative and eventually circumvent the standard. While we disagree with MRF's conclusion, we are heartened that it states the changes will make it more difficult to produce misleading look-alike "certification" labels. It is our hope that this marginal increase in difficulty will translate into a decrease in on-road use of novelty helmets.

After considering the comments, we have decided to retain the word "Certified" on the helmet, but also add the phrase "FMVSS No. 218." The goal of this part of the proposal was to clearly indicate compliance with Federal standards, and we believe the addition of "FMVSS No. 218" makes this abundantly clear.

2. Manufacturer Name and Model Designation

We believe that addition of the helmet manufacturer's name and/or brand [43] and precise model designation on the certification label is one of the most important parts of this rulemaking. Requiring this information would force producers of misleading look-alike "certification" either to fabricate information or to use a legitimate manufacturer's existing name and/or brand, thereby likely infringing upon a trademark. The manufacturer whose trademark has been infringed could take action against the infringing party under trademark law. Should the producer of the misleading look-alike "certification" labels produce a label bearing a fabricated manufacturer name and/or brand name or should a motorcyclist attach such label to his or her novelty helmet, law enforcement officials may be able to identify these labels as misleading look-alike "certification" labels.

NHTSA received several comments relating to this requirement. The American Society for Testing and Materials (ASTM), MIC, and Shark all recommended dropping the model designation requirement (but not the manufacturer's designation) from the label. They claimed that requiring manufacturers to produce a different label for each helmet model would increase costs, and that the manufacturer designation alone would have a similar effect at lower costs. Arai suggested allowing manufacturers to use trademarks as their manufacturer designation. Finally, one commenter, Max Rettig,[44] stated that the manufacturer's name should be removed from the outer label to reduce variability between helmets.

After considering the comments, we are amending the standard to require the manufacturer name and/or brand name as well as the model designation on the certification label. With regard to the comments that such a requirement could increase costs, we believe that those costs are so low as to be far outweighed by the safety benefits. As shown in more detail below, we believe that the total incremental cost for this final rule is on the order of two cents per helmet. We believe that requiring helmet manufacturers to design and produce a unique label for each helmet model is a very small and reasonable burden. We estimate that the costs to label design will be minimal, as only one design is needed for each helmet model, and most helmet manufacturers produce a relatively small number of helmet models, on the order of 10.

On the other hand, including both the helmet manufacturer's designation, i.e., name or brand name, and model designation makes the label far more difficult to produce than just including the helmet manufacturer's designation. As noted above, several commenters requested that we require only the manufacturer's designation on the helmet, as our doing so would allow them to continue to produce only one label design for all their helmets. However, the cost of preserving that relatively small convenience would be greatly facilitating the work of producers of misleading look-alike "certification" labels. These producers could similarly simply produce such labels with the designations of any known novelty helmet manufacturers. If there are any known novelty manufacturers and if they have any intellectual property rights, we would not expect them to act to protect those rights in this instance.

With regard to Mr. Rettig's comment that the manufacturer's designation should be removed from the exterior (*i.e.,* certification) label, we do not agree with the suggestion. The commenter suggested that this would reduce variability between authentic helmet labels and allow easier enforcement against novelty helmets. We do not agree. One main rationale for this change is to make labels somewhat unique to each helmet model, so that producing and obtaining misleading look-alike "certification" labels suitable for a particular helmet model are more difficult. While the commenter believes that the manufacturer's designation on the interior label would be sufficient, we note that law enforcement officers can only be certain of having the opportunity to see the exterior certification label. Mr. Rettig's suggestion would not make enforcement any easier. Further, if the manufacturer's designation were eliminated, that step would make it easier to produce misleading look-alike "certification" labels. In his comment, Mr. Rettig also suggested that NHTSA create a serial number system that would correspond to the make and model of the helmet, in order to identify helmets containing manufacturing defects more quickly. We decline to do so, because such a system is unnecessary given NHTSA's enforcement procedures, and would impose additional costs on manufacturers.

3. Water Decal and Application of a Clear Coating

As stated above, in addition to proposing additional and more distinct information on the certification label, NHTSA also considered a variety of requirements that would make it physically more difficult to apply a misleading look-alike "certification" label after the helmet had been manufactured. Among the alternatives considered in the NPRM were requiring a hologram, a trademarked DOT symbol, etching the DOT symbol into the outer surface of the helmet, and sewing the certification into the chinstrap. Ultimately, NHTSA decided not to propose regulatory text for these approaches due to tentative concerns about cost, practicability, safety, or other concerns. It stated in the preamble of the NPRM that it was proposing that the certification label be a water decal and that a clear coat be applied over it, but included in the proposed regulatory text only a requirement for clear coating on the exterior of the helmet. The agency believed that this would provide a fast and reliable way for law enforcement officers to detect misleading look-alike "certification" labels applied by end users, because these labels would present a different tactile feel than those located under the manufacturer's clear coating.

[43] A brand can take any one of several forms, for example, a name, logo, trademark, or symbol.

[44] Docket NHTSA–2008–0157–0051.

The rationale for requiring the certification label to be located underneath a clear coating was described in the NPRM.[45] The proposal was based on three assumptions. First, NHTSA stated that it believed that all current FMVSS No. 218-compliant motorcycle helmets already had a clear coat, and that it did not know of any compliant helmet model of a type for which clear coats would be impracticable (e.g., leather-shelled helmets). Second, because clear coats with water decals beneath were assumed to be universal, the agency believed that the application of a water decal under the clear coat would be essentially "costless" for manufacturers, as they would essentially add only the one-time cost of designing the decal. Third, the agency believed that it would be extremely difficult or costly for end users to duplicate the effect of a certification underneath a clear coat.

A. Comments Received

NHTSA received comments on the issue of clear coating from Shoei, Arai, Shark, ASTM, MIC, and three members of the general public on this issue. The comments made several points that directly impacted the agency's analysis of the issue. First, several commenters pointed out that, contrary to NHTSA's assumption, there were several FMVSS-compliant helmets available on the market with finishes that rendered clear coating impracticable. These included helmets with matte finishes, leather or cloth coverings, and some dyed resin plastics. Commenters stated that requiring a clear coating would, at the least, add substantial cost to some of these helmets, and be impossible for others (*e.g.,* leather or cloth-covered helmets).

Helmet manufacturers all stated that, contrary to NHTSA's belief, many helmets do not use a clear coat finish. Shark was the only manufacturer to support the proposed clear coating requirement, even as it noted two models it produced without one. Arai stated that many types of helmets, including non-glossy colors and matte finishes, do not have a clear coating applied, and that the requirement that all helmets have a clear coat would thereby limit consumer choice with regard to helmet styles. Shoei did not support the requirement either, stating that the clear coat imposes design restrictions on manufacturers, and arguing that the cost of the clear coating was much higher than NHTSA anticipated, in the range of 60 cents to one dollar per helmet.

ASTM and MIC made similar remarks in their comments. ASTM, in addition to stating that a clear coat would be inappropriate for helmets with matte or cloth finishes, pointed out that many plastic helmets are made of color impregnated thermoplastic and are not painted, and that a water decal would not be appropriate for those helmets either. ASTM argued that the labeling requirement must not restrict available exterior finishes and must allow greater flexibility to allow manufacturers to provide the requested information on the exterior of helmets. MIC listed "flat or matte finishes, polycarbonate, vacuum thermoforming finish, and [helmets with] leather or cloth exteriors" as examples where a clear coat requirement would be inappropriate, and provided Web sites where examples of those helmets could be seen. It instead requested that the proposed rule be modified to permit non clear-coat finished helmets. In the alternative, MIC requested that if a clear coat amendment is adopted, the final rule could also permit any of the "alternatives considered" in the NPRM (*i.e.,* etching, hologram, or sewn into the chinstrap) as alternative means of compliance.

B. NHTSA Analysis

As stated above, the proposed requirement for using a water decal as the certification label and placing it under clear coating rested on three assumptions. First, it assumed that the requirement was practicable, meaning that all helmet manufacturers could comply with the requirement. Second, it assumed that because all FMVSS No. 218-compliant helmets already had a clear coat, affixing a water decal certification label under the coating would be essentially costless, but for the cost of the decal itself and a change in the manufacturing process. Third, it assumed that the requirement would be effective in preventing users from attaching a misleading look-alike "certification" label to a helmet that could confuse a law enforcement officer. However, after considering the comments, re-analyzing the market, and conducting further testing, we have changed our position on all three of these assumptions. For the reasons described below, we are not adopting the water decal or clear coating requirement.

First, using the information supplied by the commenters, NHTSA was able to locate several examples of helmets certified to comply with FMVSS No. 218 on the market with leather or matte finishes, for which a clear coating would be an impracticable addition. Second, considering that it is now evident that there are many helmets that do not have a clear coat, we would need to revise our cost estimates. We have concluded that Shoei's estimate of $0.60 to $1.00 per helmet is a reasonably accurate measurement of the cost to add a clear coat and water decal to a helmet that does not already have these features.

Third and finally, NHTSA undertook additional in-house testing to verify the claims of commenters that the clear coat requirement would not be as effective a deterrent to attaching misleading look-alike "certification" labels as originally believed. The agency investigated the Web site *doingourthing.com,* which purported to describe a step-by-step set of instructions on how to affix a DOT label to a motorcycle helmet and apply a clear coating over the top of it. Based on the instructions on the Web site, we applied a DOT label purchased from the internet to the back of a test helmet and applied two coats of spray-on clear coat (polyurethane). This was a relatively simple process, and the results, while not so good as a manufacturer-applied water decal, were judged sufficient to allow a user to avoid arousing the suspicions of a law enforcement officer.

As a result of our testing, we no longer believe that using a water decal and placing it under a clear coating would be an effective means of thwarting the production and application of misleading look-alike "certification" labels. We note that in the NPRM, we reasoned that applying a "[c]lear coating over the "DOT" symbol would result in a smooth surface that is visually and tactilely different from a label applied to the surface after the clear coating process is completed."[46] Based on our experience, however, we have seen that an end user can create the look and tactile feel of a clear coating with minimal cost and difficulty. Combined with the impracticality of applying clear coats to some helmets, and substantial cost of adding it to the other helmets, we have decided not to require the certification label on any helmet to be placed under a clear coating.

C. Alternatives Considered

Despite deciding, ultimately, to not adopt the clear coat requirement, we have also decided not to adopt any of the alternative methods discussed in the NPRM for making the certification to make it more tamper-resistant. As stated above, in the NPRM, the agency analyzed three alternative methods of applying the DOT symbol: sewing the symbol into the chinstrap, etching the

[45] See 73 FR at 57302.

[46] 73 FR at 57302.

symbol into the helmet, and using a hologram to make the symbol more difficult to duplicate and thus make the misleading labeling of novelty helmets more difficult. The reasons that the agency is declining to adopt any of these alternatives, in lieu of the unadopted proposal of a clear coat requirement, are unchanged from the reasons cited in the NPRM. As discussed below, we did invite public comments on whether any or all of the alternatives should be adopted in the final rule. Our reasons for not adopting any of them are summarized below.

The agency considered each alternative to clear coating, but ultimately did not propose regulatory text for any of them because of tentative concerns regarding effectiveness or cost. Sewing the symbol onto the chinstrap was tentatively rejected because law enforcement personnel stated that it would be difficult for officers to see the symbol in that location.

Etching or embossing the symbol into the material of the helmet was tentatively rejected because the manufacturers claimed that it would be a significant economic burden to them due to higher manufacturing costs and to substantially higher scrap rates, up to 5 percent for plastic constructed helmets and 15 percent for fiberglass constructed helmet shells. The manufacturers claimed further that sharp radii, which would exist at the interface between the molded surface of the shell and the raised or recessed letters of the "DOT" symbol, would cause production problems in the molding and finishing, leading to higher manufacturing costs. Therefore, etching and embossing the DOT symbol on the helmet was tentatively judged to be an unjustified economic cost. Finally, using a hologram was tentatively rejected given the agency's belief that it would add 70 cents to the cost of a label (and thus to the cost of FMVSS No. 218-compliant helmets) and that there are other effective methods to reduce the production and application of misleading look-alike "certification" available that impose a lower burden on manufacturers.

Several commenters discussed these alternatives, or presented additional alternatives. One commenter from the law enforcement community, Mr. Steven Rust, said that a molded symbol would greatly benefit officers' ability to distinguish compliant helmets.[47] While we agree that a molded DOT symbol would make identification of novelty helmets easier, we do not believe it would be foolproof, as novelty helmet manufacturers or end users could also etch a reasonable facsimile into noncompliant helmets. Further, as explained above, this option could be very costly, due to the reported increase in manufacturing costs and scrappage rates of some helmet types.

Another commenter suggested replacing the exterior compliance label with a radio-frequency identification (RFID) tagging system,[48] which would allow law enforcement officers to simply "scan" a helmet to determine if it is compliant. A third commenter suggested replacing the manufacturer and model designation with a bar code. With regard to these two options, we believe that they would also impose disproportionate costs as they would make it necessary for law enforcement officers to purchase and carry additional equipment.[49]

One commenter suggested trademarking the DOT symbol to prevent label manufacturers from producing misleading look-alike "certification" labels.[50] We did not pursue this course of action because first, and most importantly, the agency is not able to license a trademark for manufacturers to use at their discretion. Second, trademarks are easily counterfeited and the agency has limited resources to enforce trademark rights against the printers, sellers and distributors of labels inappropriately bearing a trade-marked symbol. Therefore, we do not believe that trademarking the DOT symbol would pose an obstacle for unscrupulous producers of misleading look-alike "certification" labels.

Finally, GHSA suggested incorporating the month and year of manufacture into the information on the exterior label.[51] We are not adopting that suggestion, because it would require helmet manufacturers to update their designs monthly, at some cost, while makers of misleading look-alike "certification" labels could simply include any month and date on their designs, which would necessarily not be detectable by law enforcement. Therefore, the agency concluded that this was not an effective method for reducing the producing and applying of misleading look-alike "certification" labels.

4. Location of the Certification Label

Another change proposed in the NPRM was to widen the range of acceptable locations for the certification. Currently, paragraph S5.6.1(e) requires that the certification label be located with the horizontal centerline of the DOT symbol between 1⅛ inches (2.9 cm) and 1⅜ inches (3.5 cm) from the bottom edge of the posterior of the helmet. The reason for this requirement is to prevent the certification label from being mounted in an area that would be difficult for a law enforcement officer to see easily, such as the top of a helmet. However, due to issues of practicality, such as having large edge rolls, some manufacturers have judged it necessary to mount the certification labels a little higher than the maximum allowed distance in order to assure complete label-to-helmet contact. We note that the certification labels at issue met all other requirements. However, to address such circumstances, the agency proposed to extend the range of allowable locations for the certification label to anywhere from 1 to 3 inches (2.5 to 7.6 cm). This change would allow manufacturers more flexibility in their label placement, while still allowing law enforcement officers to observe the labels easily in the course of their duties.

Commenters universally supported the expansion of the permitted range. ASTM noted that it had petitioned the agency to make a similar change in an earlier petition for rulemaking. MIC said that for years, the current label position requirement has been problematic for any helmet with an edge cover or trim more than one inch vertically or other design feature influencing label position. Arai supported the proposal, stating that this change would give manufacturers more flexibility. Shoei also had no objections to the change.

Shark supported the proposal, but requested that there be an allowance that enables manufacturers to position the DOT label slightly off the vertical. Currently, paragraph S5.6.1(e) of the standard specifies that the DOT label be "centered laterally" and with the "horizontal centerline of the symbol located * * * [2.9 to 3.5 cm] * * * from the posterior portion of the helmet." Shark argued that in some instances, the design of a helmet precludes positioning the certification label in the center of the helmet, and that there should be an allowance for the label to be located slightly to the sides, as indicated in the photographs in Shark's comment.

Despite Shark's comment, we are not adopting a horizontal allowance for positioning the DOT label. We believe that the centered position of the exterior DOT label is important because law enforcement officers need to be able to spot the DOT label quickly and easily.

[47] Docket NHTSA–2008–0157–0042.

[48] Comment from Sachiko Jensen, Docket NHTSA–2008–0157–0053.

[49] An RFID reader costs several hundred dollars.

[50] Anonymous comment, Docket NHTSA–2008–0157–0039.

[51] Docket NHTSA–2008–0157–0021.

That is why there is a specified position location, as well as a requirement that the symbol shall appear in a color that contrasts with the background, and a minimum requirement for letter size.

5. Size of Letters/Numbers

Regarding the lettering for the certification label, the NPRM proposed a minimum lettering height of 0.09 inch (.23 cm) for the manufacturer and model designations, as well as the word "certified." As the agency received no comments on this issue, we are adopting the requirement as proposed in the NPRM.

6. Current and New Certification Labels

Figure 1—Current Certification Label

DOT

Figure 2—New Certification Label (Example)

Mfr. Name and/or Brand
Model Designation

DOT

FMVSS No. 218
CERTIFIED

7. Information Required on New Certification and Other Labels

TABLE 4

Required information	
On certification label (required to be on exterior)	On separate label or labels (typically placed in interior)
Manufacturer's name and/or brand	Manufacturer's name
Model designation	Discrete size
"DOT"	Month and year of manufacture
"FMVSS No. 218"	Instructions to the purchaser regarding construction, handling, cleaning, use, modifications, and damage
"CERTIFIED"	

b. Size Labeling

In the NPRM, the agency indicated in the preamble it was proposing to replace the current requirement in paragraph S5.6.1(c) to specify the "size" with a requirement to specify the "discrete size or discrete size range." However, in the proposed regulatory text (S5.6.1(b)), the agency proposed simply to change "size" to "discrete size."

The reason for the proposal was to preclude FMVSS No. 218 enforcement difficulties that could arise under the existing standard which requires that helmets be labeled only with a generic size specification (*e.g.,* Small, Medium, or Large). Enforceability problems can arise because while S6.1 specifies which headform is used to test helmets with a particular "designated discrete size or size range," [52] a helmet's labeled generic size may not correspond to the same size ranges that the agency uses to determine which headform to use for testing. To ensure that this issue does not cause problems in the future, the agency proposed to require the label to specify the "discrete size" of the helmet. The agency further proposed to define "discrete size" as meaning "a numerical value that corresponds to the diameter of an equivalent (±.25 inch or ±.64 cm) circle." The agency said that this definition would have two benefits. First, it would provide certainty as to the headform on which the helmet would be tested by NHTSA, thereby improving the enforceability of the standard. Second, it would provide more precise information to customers. Further, we note that the requirement would in no way preclude the manufacturer from specifying a generic size in addition to the discrete size on the size label.

1. Comments Received

NHTSA received numerous comments on the issue of size labeling. Several commenters questioned whether the proposed labeling requirements would improve the information given to consumers or aid in resolving enforceability concerns.

With regard to customer information, commenters generally stated that either the proposed labeling was not necessary, or that the discrete size information should refer to the circumference of the helmet, rather than the diameter, as proposed in the NPRM. MIC and ASTM stated that use of the diameter is essentially another way to use "hat sizes" as a means to indicate the helmet size, albeit with the precision reduced to ¼ inch increments.[53] Both commenters recommended that the label refer to the circumference, instead of the diameter, because it would allow comparison to a measurement of a consumer's head or the test headform without multiplying by the mathematical operator, pi. Shoei stated that while it had no particular objection to the proposed change in the size labeling requirement, it believes that the indication of the helmet size is only for reference purposes. On the other hand, Shark commented that the discrete size would be confusing to customers, an idea that was seconded by David Morena,[54] and that it would not reflect the actual headform sizes used for testing, although Shark did not explain why this latter statement would be so.

With regard to enforceability concerns, ASTM suggested that recent enforceability problems would not necessarily be solved by use of a "discrete," rather than generic labeled size. ASTM noted the 2007 instance in which an AFX TX–66 helmet, which

[52] Helmets with a designated discrete size not exceeding 6¾ (European size: 54) are tested on a small headform, those with a size above 6¾, but do not exceed 7½ (European size: 60) are tested on a medium headform, and those with a size exceeding 7½ are tested on a large headform. *See* S6.1.1.

[53] ASTM noted that traditional hat sizes are unitless numbers in ⅛ [inch] increments corresponding to the average diameter of the hat. *See* Docket NHTSA–2008–0157–0149, p. 4.

[54] Docket NHTSA–2008–0157–0106.

had been both generically and discretely mislabeled as being "XL (62–63 cm)," failed the impact attenuation test when tested on a large headform, but was found to pass when tested on a medium headform. It stated that the proposed discrete labeling requirement would not have had an impact on enforcement in that case.

2. NHTSA Analysis and Conclusion

After consideration of the comments received, NHTSA has decided to adopt the size labeling requirements largely as proposed in the NPRM. Despite statements by commenters, we reaffirm our belief that discrete size labeling requirements will both improve customer information regarding the size of the helmet and avert potential enforceability problems.

First, we note that some commenters may have misinterpreted what is specifically required to meet the "discrete size labeling" requirement. The specific definition in the proposal is:

Discrete size means a numerical value that corresponds to the diameter of an equivalent (± .25 inch or ± .64 cm) circle.

This proposed provision does not require that the numerical value listed on the helmet be given in quarter-inch increments. Instead, it only requires that the printed number indicate the diameter of an equivalent circle, and that circle's diameter can be rounded to the nearest quarter inch. Thus, comments that the NHTSA requirement is similar, but inferior to, "hat sizes" are incorrect. Instead, the regulation allows manufacturers to put exact hat sizes on their helmets. We also note that the requirement to include discrete sizes does not prevent manufacturers from also including a generic size marker on their helmets, if they choose to do so.

In response to comments that the discrete size definition NHTSA proposed should be based on the circumference instead of the diameter of the helmet, NHTSA is modifying its definition of "discrete size" to reflect industry convention. The industry convention has been recognized in S6.1.1 of the standard since the 1988 (Reference: 53 FR 11288, Apr. 6, 1988) amendment to the rule. When manufacturers of helmets sold in the United States (U.S.) designate a helmet's discrete size using the American convention, the discrete size is a numerical value that corresponds to the diameter of an equivalent circle and is reported in inches; however, the same helmet can be designated using a European size convention. Using the European size convention, the discrete size is a numerical value that corresponds to the circumference of an equivalent circle and is reported in centimeters. The intention of defining "discrete size" was not to change industry convention or how discrete sizes are used in the standard, but rather to explain the term. Specifying the inner diameter of the helmet in inches is equivalent to the U.S. hat size designation and specifying the interior circumference of the helmet in centimeters is equivalent to the European hat size designation. We believe that consumers are familiar with these two methods of hat size designations and thus will not be confused. For these reasons, we are amending the definition of discrete size to read:

Discrete size means a numerical value that corresponds to the diameter of an equivalent circle representing the helmet interior in inches (± 0.25 inch) or to the circumference of the equivalent circle in centimeters (± 0.64 centimeters).

We also believe that ASTM's suggestion that the proposed discrete size labeling requirement will not aid enforcement procedures is incorrect. As stated above, the reason NHTSA considered requiring manufacturers to be more precise in their size designation is because the requirement in paragraph S6.1 states that the designated size is used for testing purposes. As some manufacturers now use only generic size labeling, this can lead to questions of which headform must be used by the agency. ASTM argues that in one case, a manufacturer mislabeled a helmet both generically and discretely, and that therefore, the discrete labeling did not help NHTSA select the appropriate headform. While this is true, this is not a fault attributable to the standard, but an act of technical noncompliance by the manufacturer. The agency believes that for compliant and accurately-labeled helmets, this amendment will improve enforceability.

c. Impact Attenuation Test

The impact attenuation test is designed to ensure that a motorcycle helmet is capable of absorbing sufficient energy upon impact with a fixed hard object. Under paragraph S5.1, *Impact attenuation,* the peak acceleration of the test headform is required not to exceed 400g, accelerations above 200g not to exceed a cumulative duration of 2.0 milliseconds, and accelerations above 150g not to exceed a cumulative duration of 4.0 milliseconds.

The current impact attenuation test is specified in paragraph S7.1, *Impact attenuation test.* In this test, the helmet is first fitted on a test headform. The helmet/headform assembly is then dropped in a guided free fall onto two types of steel anvils, one flat and the other hemispherical. The first part of the test specifies two identical impacts onto the flat steel anvil, and the second part of the test requires two identical impacts onto the hemispherical steel anvil. The performance requirement is that the headform acceleration profile must be less than the specified accelerations given in S5.1.

In our 2008 proposal, NHTSA identified two aspects of the impact attenuation test that we believed needed modification. The first was the definition of the term "identical impacts," which is currently not defined in the text of the regulation. We believed that this could lead to substantial confusion for manufacturers. The second issue was the range of acceptable velocities of the impacts. This issue arose when the agency attempted to determine whether certain helmets, manufactured by NexL, complied with the impact attenuation requirements.[55] To summarize the NPRM, the agency indicated that in the absence of both a minimum and maximum acceptable velocity, it could be difficult to take enforcement action against a helmet in the event that NHTSA testing revealed a noncompliance.

1. Definition of "Impact Site"

The "identical impacts" requirement was originally derived from American National Standards Institute (ANSI) Z90.1–1971, "Specifications for Protective Headgear for Vehicular Users," which defined the term as impacts centered not more than ¼ inch (0.6 cm) apart.[56] However, because NHTSA neither adopted the ANSI definition nor incorporated it by reference, the term is undefined in the agency's standard. The standard currently reads as follows:

S7.1.2 Each helmet is impacted at four sites with two successive identical impacts at each site. Two of these sites are impacted upon a flat steel anvil and two upon a hemispherical steel anvil as specified in S7.1.10 and S7.1.11. The impact sites are at any point on the area above the test line described in paragraph S6.2.3, and separated by a distance not less than one-sixth of the maximum circumference of the helmet in the test area.

Due to the lack of a specific definition, we believe there may be two reasonable interpretations of this term. The first is that "identical impacts" means two successive impacts on the exact same spot of the test helmet, or

[55] *See* 73 FR at 57306.

[56] *See,* ANSI Z90.1, 9.3.1.

separated by not more than a reasonable tolerance (such as the ANSI Z90.1 tolerance of ¼ inch (0.64 cm)). The second is that "identical impacts" has a broader meaning, implying the exact same test conditions (*i.e.,* velocity, location, and conditioning of the helmet) for the successive impacts, regardless of whether the helmet/headform assembly actually impacted the fixed anvil at or near the same location on the helmet on the subsequent drop. In order to clarify the test procedure, the agency proposed to drop the term and replace it with a more defined specification. For reasons discussed in detail in the NPRM, the agency proposed that the standard specify that the locations of the two impacts on the helmet be no more than ¾ inch (1.9 cm) apart.

We also proposed to define the term "impact site" to mean "the location where the helmet contacts the center of the anvil." This was in response to questions raised by MIC and ASTM regarding the precise meaning of the term impact site. The proposed provision reads as follows:

• S7.1.2 Each helmet is impacted at four sites with two successive impacts at each site. For each site, the location where the helmet contacts the center of the anvil on the second impact shall not be greater than 0.75 inch [57] (1.9 cm) from the location where the helmet contacts the center of the anvil on the first impact. Two of these sites are impacted upon a flat steel anvil and two upon a hemispherical steel anvil as specified in S7.1.10 and S7.1.11. The impact sites are at any point on the area above the test line described in paragraph S6.2.3, and separated by a distance not less than one-sixth of the maximum circumference of the helmet in the test area.

The agency received three comments relating to the proposal to eliminate the term "identical impacts" and define the term "impact sites," from ASTM, MIC, and Shark. Shark stated that it agreed with the 0.75 inch (1.9 cm) tolerance between the two impacts, but requested that "both impacts should remain above the test line." While we agree with the idea, we believe that this is already clear from the language of S7.1.2, so we are not making a change from the wording of the proposed language. ASTM and MIC suggested different definitions for the term impact site, which are discussed below.

ASTM and MIC requested clarification of the term "impact site." ASTM stated that there were three possible interpretations of the proposed definition, which as stated above, is "the location where the helmet contacts the center of the anvil." These were: (1) The literal "point" where the curved helmet shell first contacts the test anvil before the test; (2) a point projected from the headform center of gravity to the center of the impact anvil; or (3) the dynamic impact "footprint" created during the impact test. Similarly, MIC suggested two similar readings: (1) The exact point where the curved helmet shell first contacts the test anvil before the test; or (2) the dynamic impact "footprint" created during the impact test. For reasons described below, we have decided to clarify the definition, and believe that the first reading provides the clearest description of what the agency intends.

NHTSA agrees that the proposed definition can be made clearer. As stated above, the proposed definition of "impact site" was "the location where the helmet contacts the center of the anvil." In the context of the proposed regulation, the term was used as follows:

• The impact sites are at any point on the area above the test line described in paragraph S6.2.3, and separated by a distance not less than one-sixth of the maximum circumference of the helmet in the test area.[58]

Our intention in proposing the revised regulation was to replace the term "identical impacts," which was comparatively vague, with a term that would be more precise and enforceable. We believe that the first reading of the definition, suggested by the commenters, is a more effective means of communicating that intent. With this new language, it should be clear that the NHTSA test requires that the headform assembly impact the anvil in two locations on the shell of the helmet. Those two locations must be located no more than 0.75 inches apart from each other. For this reason, we are amending the definition of impact site to read:

Impact site means the point on the helmet where the helmet shell first contacts the test anvil during the impact attenuation test.

NHTSA does not believe that the other interpretations offered by ASTM and MIC to define the impact site based on the dynamic footprint are appropriate for the standard. The dynamic footprint, which refers to the total area on the helmet shell that contacts the anvil during the attenuation tests, is a function of helmet design and not known until the test is complete.[59] Because the "impact site" must remain above the test line pursuant to S7.1.2, adopting this definition of impact site would require that testers limit their choice of impact sites to those well above the test line, given the uncertainty about the full extent of the deformation. We believe that this reading would introduce the very element of uncertainty into our test procedures that this rulemaking action is designed to eliminate.

NHTSA also does not believe the reading of the term "impact site" as "the point projected from the headform center of gravity to the center of the impact anvil" is accurate. This is because such a reading would conflict with paragraph S7.1.8. That paragraph, which specifies the locations of the centers of gravity of the test headform and drop assembly, allows substantially more leeway than ASTM's second suggested definition of "impact site." This definition would remove that flexibility, and impose additional burdens on testers and manufacturers without demonstrable safety benefits.

2. Specification of Test Velocity Tolerance Range

Specifying a range of acceptable speeds for the impact attenuation test was a central consideration in undertaking this rulemaking. As evidenced by the NexL case, NHTSA's current procedure for the impact attenuation test led to several difficulties with enforcement. The first was that, by testing slightly below the threshold velocity, NexL was able to claim that the test did not conclusively show that the helmet would have failed at the required velocity. Second, the specification of a minimum, but no maximum speed created a situation in which NHTSA could test at any speed above the stated minimum, leading to compliance difficulties for manufacturers. NHTSA believes that by specifying a tolerable range of speeds, and requiring that helmets be able to meet the requirements of the impact attenuation test at every speed within that range, we will provide better guidance to manufacturers and better grounds for enforcement proceedings in the event a noncompliance is demonstrated.

As stated in the NPRM, the impact attenuation requirement was adopted from ANSI Z90.1. NHTSA did not intend for its test to be markedly different from the ANSI test. The ANSI standard specifies a specific height from

[57] Due to a typographical error, this was incorrectly published as .075 inch in the NPRM. The correct value is 0.75 inch. The error has been corrected in this document.

[58] 49 CFR 571.218, S7.1.2.

[59] This is because the helmet deforms slightly when it impacts the steel anvil, so that an area larger than the initial point of contact makes contact with the anvil. Depending on how much the helmet deforms, the dynamic footprint can be a larger or smaller area.

which the assembly should be dropped. The agency translated this height requirement into the aforementioned impact velocities. Since the intent of the agency was to adopt a similar test to that of ANSI Z90.1, and since ANSI Z90.1 specified drop heights that would result in a specified velocity in a guided free fall drop, it is the agency's intent that the impact attenuation be performed close to the converted ANSI speeds for the respective tests, and not at undefined impact speeds above these respective values. The agency therefore proposed to set the tolerance for the impact attenuation velocity at ± 1.2 ft/s (0.4 m/s) from the nominal values of either 19.7 ft/s (6.0 m/s) or 17.1 ft/s (5.2 m/s) depending on the anvil test. The tolerance was based on typical calibration limits and the uncertainty associated with the test system and test setup, and was described in detail in the NPRM.[60]

In response to the proposal, NHTSA received a number of comments. Comments received from Snell, Shoei, Shark, Arai, MIC, and ASTM all stated that the proposed velocity tolerance was too large. The concern expressed by these commenters was that if tested at the extreme upper end of the tolerance range (for example, 6.4 m/s on the flat anvil), a helmet that would comply at the nominal value of 6.0 m/s would not meet the impact attenuation requirements at the higher speed. Most commenters offered specific alternative suggestions for velocity tolerances, ranging from ± 0.15 m/s to 3 percent overall tolerances. Specifically, Arai and Shark suggested a velocity tolerance of ± 0.15 m/s, ASTM and MIC suggested a velocity tolerance of ± 3 percent (which would equal ± 0.156 m/s on the hemispherical anvil test, and ± 0.18 m/s on the flat anvil), and Shoei stated that it was capable of achieving tolerances under ± 0.2 m/s. The agency has carefully considered the comments received, and for the reasons described below, has decided to narrow the range of acceptable tolerances from ± 0.4 m/s to ± 0.2 m/s.

There are two major factors that NHTSA considered when evaluating the range of acceptable tolerances. First, the agency considered impact energy with respect to helmet design. Commenters generally prefer the smallest tolerance possible because increasing the allowable tolerance can subject helmets to more force upon impact, thereby having a substantial effect on helmet performance. This could cause some currently-compliant helmets to become noncompliant based merely on a change in testing procedures, a result we hope to avoid to the extent practicable. On the other hand, the agency is also constrained in how narrow a tolerance band it can specify due to the limitations on its own testing capabilities. Because the agency tests a large number of helmets and uses a variety of laboratories to do so, it is subject to somewhat more test variability than an individual manufacturer may be. Therefore, in the sections below, we analyze both factors.

A. Impact Energy

As stated above, the concern of most commenters was that the proposed tolerance range of ± 0.4 m/s was too great, and that many helmets that meet the acceptable limits imposed by the standard at 6.0 m/s would not pass if tested at the upper limit of 6.4 m/s. For example, ASTM stated simply that "[f]rom a practical standpoint, the NPRM would increase the test velocity and energy by a significant amount without any analysis of the effect on current helmets".[61] The reason for this statement is that, in order to ensure that a helmet could pass a NHTSA performance test, a manufacturer would need to ensure that it would pass if tested at the upper extreme of the tolerance range.[62] ASTM and Snell provided information in their comments about the problems the impact attenuation test could cause, as well as recommended narrower ranges that would not present problems (± 3 percent).[63] In a similar fashion, Shark and Arai suggested that the tolerance be reduced similarly, to a range of ± 0.15 m/s. Based on the comments received, as well as further analysis of the issue, we believe that reducing the permitting tolerance to ± 0.2 m/s would alleviate as many of the concerns regarding this final rule as the values suggested by the commenters. The ± 0.2 m/s figure was selected because it is similar to the figures recommended by the commenters (± 0.15 m/s and 3 percent, which is ± 0.18 m/s for the flat anvil test), but rounded to the nearest tenth of a meter per second.

MIC and ASTM both raised the argument that, in order to assure compliance, a helmet would need to meet the standard at the upper end of the tolerance range, and therefore in lab testing the helmet would need to be able to absorb significantly more energy than the current standard requires. Specifically, both commenters noted that the impact energy imparted to the helmet in the attenuation test could vary by as much as 30 percent between the low and high ends of the proposed ± 0.4 m/s tolerance range. They also pointed out that in a recent study,[64] when tested at significantly higher speeds (+0.9 m/s for the flat anvil, and +0.8 m/s for the hemispherical anvil), up to 60 percent of helmets failed some portion of the impact attenuation test. While the agency did not propose to test helmets at nearly that level of velocity, we are aware that by requiring that helmets meet the performance specifications at any speed in the tolerance range, some manufacturers may change their protocol for self-certifying their helmets. As ASTM and MIC stated, the 3 percent tolerance range used by the Consumer Product Safety Commission (CPSC) in its helmet testing guidelines would require a lesser and reasonable increase in imparted energy.

Using figures from ASTM's comment,[65] it is clear that the energy levels from the ± 0.2 m/s tolerance range the agency is considering are very similar to those proposed by ASTM and MIC. ASTM indicated that an increase from the currently-required 6.0 m/s to the highest-possible speed of 6.4 m/s would increase the imparted energy (using a large headform on the flat anvil) from 110 Joules to 125 Joules. Using the 6.18 m/s figure suggested by the commenters, the helmet would be subjected to only 116.5 Joules, compared to 117.2 Joules at a velocity of 6.2 m/s. We believe that there would be no substantial difference in terms of which helmets have difficulty complying with the impact attenuation requirements and wish to highlight the fact that the current text of the Standard specifies a minimum speed of 6.0 m/s.

In its comments, Snell presented a mathematical formula[66] by which one could calculate the amount of time a helmet's acceleration exceeded 200g. Snell used the formula to indicate that of six hypothetical helmets that would

[60] *See* 73 FR at 57307.

[61] Docket NHTSA–2008–0157–0150, p. 6.

[62] While the tolerance range would apply to both the flat and hemispherical anvil tests, the flat anvil test is generally where one would expect any failures to occur. Therefore, this notice generally refers to the velocities specified in the flat anvil tests (6.0 m/s plus a tolerance interval), instead of those in the hemispherical test (5.2 m/s plus a tolerance interval).

[63] This translates to a range of ± 0.18 m/s for the flat anvil test, and ± 0.156 m/s for the hemispherical anvil test.

[64] Thom, Hurt, Ouellet & Smith, "Modernization of the DOT Motorcycle Helmet Standard," Proceedings of the International Motorcycle Safety Conference, 2001.

[65] Docket NHTSA–2008–0157–0150, p. 6.

[66] The formula for computing the amount of time a helmet's acceleration is at or above 200g is $(T_{@200g}) = 1.25 * (1–2 * \arcsin(200/PG)/\pi)$ se $* T_L$ where PG is the peak acceleration of the impact pulse (quarter sine wave) and T_L is the time duration during the loading phase. Details provided in docket NHTSA–2008–0157–164.3.

meet the requirements if tested at 6.0 m/s (ranging from marginal to exceptional compliance with the S5.1(b) requirement), three would not pass if tested at 6.4 m/s.[67] The performance of the six hypothetical helmets, if tested at a velocity of precisely 6.0 m/s, is shown in Table 5 below. Note that helmet #1 barely meets the performance requirement when tested at this speed, as paragraph S5.1(b) limits the duration above 200g to 2.0 milliseconds or less.

TABLE 5

Velocity (6.0 m/s)	Peak G (G)	Pulse time-loading (msec)	Pulse time-unloading (msec)	Pulse time-total (msec)	Pulse time at or above 200 G (T@200g) (msec)
helmet #1	250	3.84	0.96	4.80	2.0
helmet #2	240	4.00	1.00	5.00	1.9
helmet #3	230	4.18	1.04	5.22	1.7
helmet #4	220	4.37	1.09	5.46	1.5
helmet #5	210	4.57	1.14	5.72	1.1
helmet #6	201	4.78	1.19	5.97	0.4

Using this formula, Snell calculated that half of the helmets would not comply with the standard if tested at 6.4 m/s. The calculations for an impact velocity of 6.4 m/s are shown in Table 6.

TABLE 6

Velocity (6.4 m/s)	Peak G (G)	Pulse time-loading (msec)	Pulse time-unloading (msec)	Pulse time-total (msec)	Pulse time at or above 200 G (T@200g) (msec)
helmet #1	266.7	3.84	0.96	4.80	2.2
helmet #2	256.0	4.00	1.00	5.00	2.1
helmet #3	245.0	4.18	1.04	5.22	2.1
helmet #4	234.7	4.37	1.09	5.46	1.9
helmet #5	224.0	4.57	1.14	5.72	1.7
helmet #6	214.4	4.78	1.19	5.97	1.4

In order to assess whether the ± 0.2 m/s tolerance interval would not cause undue burdens for helmet manufacturers, we employed the mathematical model of helmet impact testing used by Snell. We measured whether the compliance burdens would be more difficult using the ± 0.2 m/s than the ± 0.15 m/s tolerance recommended by Shark, Arai, and Shoei, as well as the ± 0.18 m/s tolerance recommended by MIC and ASTM.[68] The peak G (peak acceleration of the impact pulse) at the different impact velocities examined (6.15 m/s, 6.18 m/s, and 6.2 m/s) were determined by linearly interpolating between the peak G values in Table 5 for the 6 m/s impact velocity and those in Table 6 for the 6.4 m/s impact velocity. The calculations for ± 0.15 m/s and ± 0.18 m/s impact velocity tolerance are shown in Tables 7 and 8, respectively. The calculations for a ± 0.2 m/s impact velocity tolerance (impact velocity at 6.2 m/s) are shown in Table 9. As shown, only one of the hypothetical helmets in Snell's analysis (helmet #1, which marginally complied with the standard S5.1(b) when tested at exactly 6.0 m/s) showed only a marginal failure when tested at the other three impact velocities.

TABLE 7

Velocity (6.15 m/s)	Peak G (G)	Pulse time-loading (msec)	Pulse time-unloading (msec)	Pulse time-total (msec)	Pulse time at or above 200 G (T@200g) (msec)
helmet #1	256.3	3.84	0.96	4.80	2.1
helmet #2	246.0	4.00	1.00	5.00	2.0
helmet #3	235.8	4.18	1.04	5.22	1.9
helmet #4	225.5	4.37	1.09	5.46	1.7
helmet #5	215.3	4.57	1.14	5.72	1.4
helmet #6	206.0	4.78	1.19	5.97	0.9

[67] Pursuant to paragraph S5.1(b), accelerations in excess of 200g shall not exceed a cumulate duration of 2.0 milliseconds. It is this requirement that is most likely to cause a helmet to fail to comply with FMVSS No. 218.

[68] Docket NHTSA–2008–0157–0164.3.

TABLE 8

Velocity (6.18 m/s)	Peak G (G)	Pulse time-loading (msec)	Pulse time-unloading (msec)	Pulse time-total (msec)	Pulse time at or above 200 G (T@200g) (msec)
helmet #1	257.5	3.84	0.96	4.80	2.1
helmet #2	247.2	4.00	1.00	5.00	2.0
helmet #3	236.9	4.18	1.04	5.22	1.9
helmet #4	226.6	4.37	1.09	5.46	1.7
helmet #5	216.3	4.57	1.14	5.72	1.4
helmet #6	207.0	4.78	1.19	5.97	1.0

TABLE 9

Velocity 6.2 m/s	Peak G (G)	Pulse time-loading (msec)	Pulse time-unloading (msec)	Pulse time-total (msec)	Pulse time at or above 200 G (T@200g) (msec)
helmet #1	258.3	3.84	0.96	4.80	2.1
helmet #2	248.0	4.00	1.00	5.00	2.0
helmet #3	237.7	4.18	1.04	5.22	1.9
helmet #4	227.0	4.37	1.09	5.46	1.7
helmet #5	217.0	4.57	1.14	5.72	1.4
helmet #6	207.7	4.78	1.19	5.97	1.0

Based on these calculations, we do not believe that there is a significant difference if a helmet is tested at the outer limits of a ± 0.2, ± 0.18, or ± 0.15 m/s tolerance range. Further, as discussed above, we believe that the energy differential is small enough at a ± 0.2 m/s tolerance that there will be little if any difference in the marginal number of helmets that may experience compliance difficulty if tested at the outermost extremes of the tolerance range.

B. Achievable Tolerances

While the agency's desire to limit the potential increased impact energy brings the tolerance down, we are also careful to make sure the tolerances we specify are readily achievable by testing laboratories. In the NPRM, NHTSA used a statistical analysis of calibration error and non-calibration errors (derived from uncertainties in the test setup and testing variability) to determine the overall maximum possible error resulting from all variations combined. Based on our statistical analysis, we determined that in 95 percent of trials, a maximum error of 0.4 m/s was possible given the compound effect of all errors. Therefore, we proposed that the impact speed be specified as 5.2 m/s (6.0 m/s for the flat anvil) ± 0.4 m/s.[69]

As explained above, numerous commenters took issue with the ± 0.4 m/s figure, stating that if a helmet were tested at the upper end of the tolerance range, the significant amounts of extra energy gained could cause it to not meet the requirements of the impact attenuation test. Therefore, we have taken a new look at the available data to determine if a narrower tolerance range is practical given the limitations of testing equipment. After having performed an analysis of statistical data collected on 2,496 impact attenuation tests done by two test labs during 2007 and 2008, the agency has determined that it is feasible to narrow the tolerance to ± 0.2 m/s and still have nearly all tests fall within the bounds of the required tolerance. The goal was to ensure that whatever tolerance was adopted would capture at least 99 percent of the potential total test variability.

In determining a suitable interval of velocities for the helmet drop test, NHTSA examined a wide variety of factors that could contribute to test variability.[70] These included the velocity of the helmet, between-lab variability in velocity measurement, the effect of helmet conditioning, the location of the drop on the anvil, the difference between the first and second drops on the same location on the anvil, and a "random error" variable. After performing a statistical analysis of all variables, NHTSA determined that only helmet velocity (a standard deviation of 0.045 m/s for the hemispherical anvil, and 0.048 m/s for the flat anvil) and between-lab variability (a standard deviation of 0.017 m/s for the hemispherical anvil, and 0.020 m/s for the flat anvil) showed statistically significant differences in overall test performance. Combining these two independent sources of variability by the Root Sum Square method, NHTSA derived the following ranges for the 99 percent confidence interval:

[69] 73 FR 57306.

[70] The analysis is presented in more detail in "Analysis of Helmet Impact Velocity Experimental Data and Statistical Tolerance Design," NHTSA, DOT HS 811 305, April 2010. Available at *http://www-nrd.nhtsa.dot.gov/Pubs/811305.pdf.*

TABLE 10

Anvil type	Nominal velocity	99% confidence interval	± 3% velocity	Nominal velocity ± 0.2 m/s
Hemispherical	5.2 m/s	5.06–5.34 m/s	5.04–5.36 m/s	5.0–5.4 m/s.
Flat	6.0 m/s	5.84–6.16 m/s	5.82–6.18 m/s	5.8–6.2 m/s.

As shown in the table, the maximum possible allowable tolerance needed to ensure 99 percent of tests fall within the allowable range is ± 0.16 m/s. This is larger than the ± 0.15 m/s proposed by Shoei, Shark, and Arai, but just within the ± 3 percent velocity tolerance proposed by MIC and ASTM. Therefore, we believe that this is a feasible tolerance to use for testing purposes. We note that we have increased the maximum tolerance slightly to ± 0.2 m/s for rounding purposes, but do not believe that that will have a significant effect on the test, as shown in the section above.

d. Penetration Test

In addition to the impact attenuation and retention tests, the helmet standard also requires that compliant helmets meet a penetration test. The penetration test, described in paragraphs S7.2 through S7.2.8 of FMVSS No. 218, specifies that a penetration striker makes two separate blows to the exterior of the helmet, with the striker on a guided free fall. In the NPRM, NHTSA described the penetration test and proposed modifications to the helmet conditioning procedure that precedes it and the other two performance tests in paragraph S7. While NHTSA did not specifically propose adding test tolerances for the penetration test, several commenters suggested that the need for tolerances in this test was no different than the need for tolerances in the other performance specifications. The commenters recommended that, similar to other modifications in this rulemaking, small tolerances be added to the various specified dimensions of the striker and the drop height.

1. Comments Received

Four commenters discussed the penetration test. Two commenters, Andy F. Malinowski and ASTM, recommended that the penetration test be removed from the standard. Mr. Malinowski stated that it was unnecessary because "in an accident a helmet will normally hit a flat surface." ASTM cited research on helmet performance in Europe (the COST 327 study),[71] which recommended that penetration testing be deleted from standards. The commenter also stated it believes the epidemiology of U.S. accidents supports this position. Two helmet manufacturers, Shark and Arai, recommended that tolerances be added to the specifications for the drop height, mass, angle, cone height, and tip radius of the penetration striker. While Arai did not provide a specific rationale for its recommendations, Shark stated that its recommendations were made "in order to harmonize the equipment and repeatability of tests."[72] The recommendations made by the two manufacturers were nearly identical (with a slight difference in the cone height recommendation), and are reproduced below:

TABLE 11

Test specification (current requirement)	Arai recommendation	Shark recommendation
Drop height of penetration striker (3 m)	± 0.015 m	± 0.015 m.
Mass of penetration striker (3 kg)	± 0.05 kg	± 0.05 kg.
Included angle of penetration striker (60 degrees)	± 0.5 degrees	± 0.5 degrees.
Cone height of penetration striker (3.8 cm)	± 0.38 mm	± 0.35 mm.
Tip radius of penetration striker (0.5 mm)	± 0.1 mm	± 0.1 mm.

2. NHTSA Analysis and Conclusion

After carefully considering the comments, NHTSA has decided to add the recommended tolerances to the penetration test standard.[73] Given that the purpose of this rulemaking action is to increase the repeatability and enforceability of FMVSS No. 218,[74] we believe that the addition of these tolerances to the penetration test procedures is well within the scope of this rulemaking. Further, we believe that the specific test tolerances proposed by the two manufacturers are reasonable. We note that, with the exception of the suggested tip radius tolerance, no suggested tolerance is more than ± 2 percent of the total requirement. Even the tip radius tolerance, which is ± 20 percent of the total radius requirement, is still only 0.1 mm, and we do not believe that a difference of this magnitude would significantly alter the test. The agency believes that the tolerances suggested are appropriate for the manufacturing capabilities of test equipment manufacturers, and the calibration abilities of test laboratories, and notes that the values are similar to those expressed in NHTSA's test procedure.[75] Further, we do not believe that adjusting any or all of the properties of the penetration striker by the limit of the proposed tolerances would substantially alter the test results or have a deleterious effect on safety.

NHTSA is not following the suggestion of those commenters who requested that the penetration test be removed from the standard. To begin, we believe that such an action would be well outside of the scope of this rulemaking, which is designed to

[71] Chinn B., Canaple B., Derler S., Doyle D., Otte D., Schuller E., Willinger R. (2001) COST 327 Motorcycle Safety Helmets. Final Report of the Action.

[72] Docket NHTSA–2008–0157–0166.

[73] With regard to the small difference in the recommended cone height tolerances, we have decided to use Arai's recommendation of 0.38 mm, rather than Shark's recommendation of 0.35 mm, so that the tolerance is exactly 1 percent of the 3.8 cm cone height requirement. With regard to the recommendation to adopt the ± 0.5 kg tolerance to the mass of the penetration striker, FMVSS No. 218 uses English units as the primary units cited in the standard and due to rounding, we have decided to use ± 2 ounces as the tolerance.

[74] See 73 FR at 57308, which reads "[i]n keeping with the theme of providing more clearly defined, enforceable testing procedures for FMVSS No. 218 * * *"

[75] NHTSA test procedure TP–218–06, available at *http://www.nhtsa.gov.*

increase enforceability and clarity and make minor updates to the standard. Removing one of three performance tests would be a major modification to the substantive safety requirements and a major deviation from the NPRM. Second, we do not agree with the commenters that the penetration test is not meaningful. In 1997, an agency study on the feasibility of upgrading FMVSS No. 218 suggested that the agency retain the current penetration tests, describing them as meaningful.[76] The agency relied on this study in 2006, in its denial of a petition of inconsequential noncompliance for Fulmer Helmets.[77] While we recognize that ASTM submitted a 2007 petition for rulemaking regarding substantive updates to the helmet standard, including, among other issues, removing the penetration test, we will address that subject in response to ASTM's original petition at a later date. Therefore, in this final rule, we are not removing the penetration test requirement from the standard.

For the reasons above, we are amending paragraphs S7.2.4, S7.2.6, and S7.2.7 to reflect the addition of tolerances for the penetration test.

e. Quasi-Static Retention Test

FMVSS No. 218 specifies a static retention test as part of the performance specifications. The purpose of the test is to demonstrate that the retention system has the structural integrity necessary to help ensure that a motorcyclist's helmet stays on his or her head in the event of a crash. The test was originally adopted from the ANSI Z90.1 standard, which applied a static tensile load to the retention assembly of a complete helmet. Currently, the retention test, described in paragraphs S7.3 through S7.3.4 of the standard, specifies that a 50-pound (22.7 kg) preliminary load, followed by a 250-pound (113.4 kg) test load, is applied to the retention assembly. However, testing laboratories must apply the load at some rate, and the current regulation does not specify how this load is applied to the retention assembly.[78] Without that specification, there is some latitude as to what rate a test laboratory should increase the force until the full 300-pound load is applied to the retention assembly. Such latitude is what led to the dispute between NexL and NHTSA, described above, over whether certain NexL helmets complied with the retention requirements.

In order to increase the clarity and enforceability of the retention specification, the NPRM proposed adding a specific load application test to the requirements, and recharacterizing the test as a "quasi-static" test, to reflect the new dynamic aspect. There were three reasons for proposing a rate. First, NHTSA believed that specifying the rate would help helmet manufacturers self-certify their products with a greater degree of certainty. Second, providing a load application rate would prevent manufacturers from using a significantly different rate from NHTSA's compliance laboratories, and thus attaining different results, as occurred in the NexL case.

The proposed load application rate was 0.4 to 1.2 inches (1 to 3 cm) per minute, the same rate as was specified in NHTSA's test procedures. We believe that this rate is reasonable and consistent with what the agency and the majority of manufacturers have been using in their compliance testing.

NHTSA received three comments that discussed the load application rate. Arai, ASTM, and MIC all agreed with the specification of a quasi-static load application rate, all of them stating that specifying such a rate would be appropriate and that they have no objections to the 0.4–1.2 inches (1–3 cm) per minute value proposed by the agency. The agency also received numerous comments, discussed below, that helmet retention strength can cause neck injuries, although without supporting information.

Based on our analysis and the comments received, we are adopting the load application rate proposed in the NPRM. We are not altering the proposal in response to comments suggesting that increased retention system strength may cause neck injuries. First, we note that this change does not increase the retention strength; it merely clarifies how it is to be measured. Second, as noted in the NPRM, our research indicates that helmets do not change injury rates to any areas of the body, and the commenters provided no data to indicate otherwise. Therefore, we are amending paragraphs S7.3.1 and S7.3.2 to reflect the specified load application rate.

f. Helmet Conditioning Tolerances

In order to ensure repeatability of testing, FMVSS No. 218 requires that helmets be conditioned in a certain manner before testing. These conditioning specifications are laid out in paragraph S6.4.1. This paragraph describes four conditions to which a helmet must be exposed for a 12-hour period of time before being subjected to the testing sequences described in paragraph S7 of the regulation; and specifies temperatures, relative humidity, and the time periods for which the helmet must be exposed.

As described in the NPRM, the agency proposed to modify the temperatures to include a range of temperatures and relative humidity. The NPRM also proposed that the current 12-hour time period be specified as a minimum time period for conditioning. Similar to the rationale for proposing tolerances throughout FMVSS No. 218, we stated that this would enable NHTSA to undertake legally enforceable testing of helmets at the conditions specified within the tolerances. The specific values proposed in the NPRM[79] were:

(a) *Ambient conditions.* Expose to any temperature from 61 °F to and including 79 °F (from 16 °C to and including 26 °C) and any relative humidity from 30 to and including 70 percent for a minimum of 12 hours.

(b) *Low temperature.* Expose to any temperature from 5 °F to and including 23 °F (from −15 °C to and including −5 °C) for a minimum of 12 hours.

(c) *High temperature.* Expose to any temperature from 113 °F to and including 131 °F (from 45 °C to and including 55 °C) for a minimum of 12 hours.

(d) *Water immersion.* Immerse in water at any temperature from 61 °F to and including 79 °F (from 16 °C to and including 26 °C) for a minimum of 12 hours.

Comments received on the matter of helmet conditioning were received from ASTM, MIC, Arai, Shoei, and Shark. Two issues were raised by commenters that warrant reconsideration of the proposed values by the agency. Many groups suggested that the conditioning time proposed by the agency be substantially revised, from the proposed 12-hour minimum period to a range of 4 to 24 hours. Additionally, while some commenters agreed with NHTSA's proposed temperature and humidity tolerances, several suggested narrowing the limits.

[76] D.R. Thom, H.H. Hurt, T.A. Smith, J.V. Ouellet, "Feasibility Study of Upgrading FMVSS No. 218, Motorcycle Helmets," Head Protection Research Laboratory, University of Southern California, DTNH22–97–P–02001. See conclusions, p. 54.

[77] 71 FR 77092, December 22, 2006.

[78] While the regulation does not specify it, NHTSA's test procedures specify that the load is applied at 1.0–3.0 cm/min. See NHTSA TP–218–06.

[79] It should be noted that there was a discrepancy in the preamble and proposed regulatory text of the NPRM. While the preamble cited a temperature range for the water immersion test of 68–86 degrees F, the regulatory text specified a range of 61–79 degrees. The figures for the water immersion test in the preamble are a clerical error, and we note that the tests should be conducted at ambient temperatures, and the range of 61–79 degrees corresponds to the dry ambient temperature range given in the NPRM.

With regard to helmet conditioning time, the basic argument cited by multiple commenters is that the values in this range would permit helmets to be conditioned during normal business hours, thereby reducing the burden of testing. Further, they argued that the helmet is in a steady state during this entire range, so that additional conditioning time beyond four hours does not affect the ability of the helmet to meet the performance specifications. Finally, commenters requested that a maximum conditioning time be specified, to prevent a situation where a helmet is subject to indefinite conditioning.

Based on our analysis of the comments and further research into the subject, in this final rule NHTSA is modifying the conditioning times based on suggestions from the commenters and further analysis done by the agency. Given the commenter's arguments, we investigated the claims that a four-hour conditioning period would adequately condition a helmet, and note the statement in ASTM's comment that a 1997 study commissioned by NHTSA stated, "The data * * * show no statistically significant effect of reducing the pre-test environmental conditioning time from 12 to 4 hours."[80] Based on this more recent study, and the comments received by multiple sources, NHTSA has agreed to adopt a minimum helmet conditioning time of no less than four hours for all helmet conditions. Additionally, to address concerns of helmets being conditioned indefinitely, we are adopting a maximum helmet conditioning time of 24 hours for the low and high temperature conditions, and water immersion procedures. In addition to preventing indefinite conditioning, this figure will permit overnight conditioning of helmets and the agency does not believe that it will affect compliance at all. It also aligns NHTSA's standard with other helmet standards that use 4–24 hour conditioning periods.

With respect to the conditioning temperature and relative humidity, the agency received comments that both supported the proposed values as well as those that suggested alternative values for these conditions. ASTM and MIC supported the values proposed in the NPRM, stating that there has never been any evidence that ambient humidity affects helmet performance, as well as supporting the proposal to equalize ambient room and water temperatures.

Foreign-based motorcycle helmet makers suggested that the agency adopt different values. Arai suggested the following test conditions:

Ambient Condition: temperature 25 ± 5 °C; relative humidity 60 ± 20%.

Hot Condition: temperature 50 ± 2 °C.

Cold Condition: temperature −10 ± 2 °C.

Water Immersion: temperature 25 ± 5 °C.

In its comment, Arai argued that these conditioning values would make NHTSA's condition nearly identical to other national standards, including JIS T8133: 2007;[81] BS6658: 1985;[82] and ECE R22–05.[83] Shark recommended the same values as Arai, except that it recommended a cold condition of −20 ± 2 °C. Similarly, Shoei recommended narrower ± 2 °C tolerances for hot and cold temperature tolerances, stating that their current conditioning unit controls temperature very precisely, and that it is possible to maintain this narrow range. It also specifically commented that the range for the cold condition was problematic due to the sensitivity of plastics to cold temperatures, and stated that it had experience that a product not affected at −5 °C was broken at −15 °C.

After carefully considering the comments and issues involved, NHTSA has decided to adopt the temperature and humidity values and tolerances proposed in the NPRM. While we are cognizant of the desire by some manufacturers to use the tolerances they use for foreign testing, we do not believe that the use of such narrow tolerance ranges is necessary to ensure safety or produce repeatable results. Further, based on the equipment familiar to the agency, and contrary to Shoei's comment, the equipment necessary to maintain this tight tolerance across all conditions is cost prohibitive and would be an additional burden on helmet testers. For these reasons, the agency declines to alter the proposed values and will maintain a ± 5 °C tolerance for each of the conditioning procedures.

g. Other Tolerances

While not discussed in the NPRM, NHTSA received comments regarding several other parts of FMVSS No. 218 where tolerances could provide additional flexibility and/or guidance. Two helmet manufacturers, Arai and Shark, suggested adding tolerances to the values in Table 1 of the standard, which specifies weights for the impact attenuation test drop assembly for small, medium, and large test headforms. According to paragraph S7.1.7, the drop assembly weights listed in Table 1 consist of the weight of the test headform and the supporting assembly.

Both Arai and Shark commented that NHTSA should specify a tolerance for the drop assembly weights in Table 1 of the standard. Currently, the weights specified are 3.5, 5.0, and 6.1 kg, for the small, medium, and large test headform drop assemblies, respectively. The commenters (specifically Arai) stated that it is not realistic for test labs to provide ± 0.0 kg drop assembly mass, as this degree of precision is nearly impossible for test equipment manufacturers. Arai requested that NHTSA add tolerances of ± 0.1 kg to the weights in Table 1, while Shark requested a ± 0.15 kg tolerance be added to these values. While not specifically proposed in the NPRM, this minor clarification is closely related to the goals of adding reasonable and enforceable tolerances to FMVSS No. 218.

After considering the comments, NHTSA is adding a tolerance of ± 0.1 kg (± 0.2 lb) to the weights specified Table 1. We believe that because the weight of the supporting assembly[84] is specified as a range of 0.9–1.1 kg (*i.e.,* 1.0 ± 0.1 kg), in paragraph S7.1.7, a tolerance level is appropriate for the combined weight of the drop assembly. NHTSA examined the increase in impact energy for the upper bound of allowable drop assembly weight (3.6 kg for small headform, 5.1 kg for medium headform and 6.2 kg for large headform) and found that it only increased by 1.5 to 3 percent from that currently in the standard. The change in impact energy due to the allowable tolerance in drop assembly weight is significantly smaller than that due to the allowable tolerance in impact velocity. Therefore, we believe the drop assembly weight tolerance of ± 0.1 kg is practicable and will have little, if any, effect on helmets that currently comply with the standard. The addition of the ± 0.1 kg tolerances will be added to the drop assembly weights in Table 1.

h. Other Issues Addressed in the NPRM

As discussed in the NPRM, the agency is updating the standard to include a more recent version of the SAE Recommended Practice currently incorporated by reference in the standard. Paragraph S7.1.9 currently

[80] Thom, Hurt, Smith & Ouellet, "Feasibility Study of Upgrading FMVSS No. 218, Motorcycle Helmets," Head Protection Research Laboratory, University of Southern California, Final Report, September 1977.

[81] Japan.

[82] United Kingdom.

[83] UN Economic Commission for Europe.

[84] The supporting assembly weight is defined as the drop assembly weight minus the combined weight of the test headform, the headform's clamp down ring, and its tie down screws. See S7.1.7.

specifies that "the acceleration data channel complies with SAE Recommended Practice J211 JUN 80, Instrumentation for Impact Tests, requirements for channel class 1,000." SAE Recommended Practice J211 has been revised several times since June of 1980 and the agency proposed to update the cited practice to SAE Recommended Practice J211/1, revised March 1995, "Instrumentation for Impact Test—Part 1—Electronic Instrumentation." This version is consistent with the current requirements for the regulation's filter needs, and it is also consistent with other recently updated standards and regulations. As the agency did not receive any comments regarding this part of the proposal, the new updated version of J211 is being incorporated into the standard.

The agency is also correcting a typographical mistake regarding the labeling of Figures 7 and 8 in the standard. We noted that Figures 7 and 8 in FMVSS No. 218 were inadvertently switched at some time in the past. To correct this error, NHTSA proposed to keep the titles the same for each Figure, and to switch the diagrams so the diagrams for the medium and large headforms properly correspond to the figure titles. This change is being made to the standard.

i. Other Issues Raised by Commenters

In addition to the issues specifically addressed in the NPRM, many commenters addressed matters that were not central to the issues of helmet labeling or changing the tolerances for test procedures. Nonetheless, we will address those issues briefly in this section.

1. Necessity of Universal State Helmet Use Laws and Specifications

Many commenters, including many of the individual commenters who submitted their statements to the docket, took the opportunity to argue for or against State helmet use laws. Given the substantial contributions by helmets to reducing deaths and injuries, and the inability of other measures to reduce substantially the need for those contributions, NHTSA strongly encourages the use of motorcycle helmets by all motorcyclists while riding, and the enactment of State laws requiring such use.

In addition, NHTSA seeks to ensure that helmets sold for use by motorcyclists are safe and effective. To that end, NHTSA promulgated FMVSS No. 218, which provides a minimum set of performance requirements that all motorcycle helmets must meet. To aid in the enforcing of State helmet use laws, we are adopting improved labeling requirements in this rule so that law enforcement officers can better distinguish compliant motorcycle helmets from noncompliant helmets or other headwear that riders may be wearing or purchasing.

MRF also asked questions about existing helmets. They asked whether existing helmets would continue to be legal, or whether riders would need to purchase new helmets after the final rule becomes effective. MRF also asked what would become of unsold older helmets. Questions regarding State helmet use laws need to be directed to the States. As to FMVSS No. 218, it applies to newly-manufactured motorcycle helmets. Manufacturers may continue to produce helmets and certify them to the current version of FMVSS No. 218 until the effective date of this final rule. Those older certified helmets may be sold even after the effective date of this rule.

2. Recent Actions by the National Transportation Safety Board and American Academy of Orthopaedic Surgeons in Support of Universal State Motorcycle Helmet Use Laws

In November 2010, NTSB updated its Most Wanted List of Transportation Safety Improvements by adding motorcycle safety to it and urging all States to require that all persons shall wear a FMVSS No. 218-compliant motorcycle helmet while riding (operating), or as a passenger on, any motorcycle.[85] NTSB released a map of the United States detailing[86] which States have full and effective laws and which States do not.

In addition, it issued a safety alert[87] documenting the extent of the motorcycle safety problem and the contributions that helmets can make to address that problem. It published the following information and urged States to enact universal helmet use laws:

The grim facts:

- Deaths from motorcycle crashes had more than doubled in the past decade—from 2,294 in 1998 to 5,290 in 2008—Another 96,000 people were injured in motorcycle crashes in 2008.
- Although there was a decline in 2009, 4,462 motorcyclists, or an average of 12 motorcyclists everyday, were still lost! Another 90,000 motorcyclists were injured.
- The number of motorcycle deaths in 2009 is more than double the total number of people killed in 2009 in all aviation, rail, marine and pipeline accidents combined.
- Head injuries are a leading cause of death in motorcycle crashes.
- Motorcyclists who crash without a helmet are three times more likely to have brain injuries than those wearing a helmet.
- In addition to the tragic loss of life, the economic cost to society is enormous. In 2005, motorcyclists without helmets were involved in 36 percent of all motorcycle crashes, but represented 70 percent of the total cost of all motorcycle crashes—$12.2 billion.
- Medical and other costs for unhelmeted riders involved in crashes are staggering, estimated at $310,000 per crash-involved motorcyclist. That's more than four times the overall cost of accidents involving helmeted riders.

Helmets save lives

- DOT-compliant helmets (DOT FMVSS 218) are extremely effective. They can prevent injury and death from motorcycle crashes.
- Wearing a helmet reduces the overall risk of dying in a crash by 37%.
- In addition to preventing fatalities, the use of helmets reduces the need for ambulance service, hospitalization, intensive care, rehabilitation, and long-term care as a result of motorcycle crashes.
- Wearing a helmet does *not* increase the risk of other types of injury.

Motorcycle helmet laws

- 20 states, D.C., and 4 territories require all riders and passengers to wear helmets; 27 states and 1 territory have partial laws requiring minors and/or passengers to wear helmets; currently 3 states, Illinois, Iowa and New Hampshire have no helmet use requirement.
- States that have repealed laws requiring all riders and passengers to wear helmets have seen dramatically lower helmet usage rates and significant increases in deaths and injuries.
- Partial laws do not protect younger riders. Only universal helmet laws significantly reduce fatality rates for riders aged 15–20.

In September 2010, the American Academy of Orthopaedic Surgeons (AAOS) revised its position statement urging the States to enact laws requiring the use of motorcycle helmet use laws.[88] The statement says, in part:

Orthopaedic surgeons, the medical specialists most often called upon to treat injuries to cyclists, believe a significant reduction in fatalities and head injuries could be effected through the implementation of laws mandating the use of helmets by all motorcycle and bicycle drivers and passengers. The AAOS strongly endorses such mandatory helmet laws.

Numerous studies in various parts of the United States have shown that helmet use reduces the severity and cost associated with injuries to motorcycle riders. Federal efforts beginning with the Highway Safety Act of 1966 achieved the passage of state laws

[85] *http://www.ntsb.gov/Recs/mostwanted/motorcycle_safety.htm.*

[86] *http://www.ntsb.gov/Recs/mostwanted/motorcycle_helmet_laws_map_2010.pdf.*

[87] The full safety alert is available at *http://www.ntsb.gov/alerts/SA_012.pdf.*

[88] *http://www.aaos.org/about/papers/position/1110.asp.*

mandating helmet use and by 1975, 47 states had enacted such laws. With the Highway Safety Act of 1977, however, Section 208 of which relaxed the pressure on states to have helmet laws, the federal government created the opportunity to measure the effectiveness of helmet use when 27 states repealed their helmet laws in the following three years.

Objective analysis of data from the mid 1990s (when helmet laws were widespread) and the late 1990s (when more than half the states had repealed such laws) shows clearly that head injuries and fatalities of motorcycle riders are reduced when motorcyclists wear helmets.

Moreover, the costs associated with treating motorcycle riders head injuries have been demonstrated to be significantly reduced—up to 80 percent in one university study—when helmet laws are in effect.

Recent studies again confirmed that the use of helmets reduces the risk of mortality and severe head injury with motorcycle riders who crash, although the former effect may be modified by other crash factors such as speed.

3. Role of Rider Education

Another issue raised extensively in comments is rider education. Many commenters argued that education could play a far larger role in creating benefits than the current rulemaking action. We agree that education and safe operating and riding practices are important. However, for the reasons discussed above near the beginning of this preamble, such education and practices do not and cannot reduce the need for enactment and implementation of up-to-date universal State helmet use laws. Even with education and safe operating and riding practices, there will continue to be substantial numbers of motorcycle crashes. As we have shown above, in the event of a crash, wearing a compliant helmet produces significant benefits at a relatively modest cost. NHTSA encourages motorcycle operators and riders and drivers of other motor vehicles to be cognizant of all road traffic and to drive in a safe manner.

4. Allegations of Potential for Helmets To Cause Harm

A number of opponents of mandatory helmet use argued that helmets cause injuries, rather than, or in addition to, alleviating others. Some commenters stated that helmet use has been linked to neck and spinal injuries. One commenter [89] submitted a report describing how full face helmets have been linked to basal skull fractures due to the transmission of impact energy from the face bar through the chin strap and into the skull.

The overwhelming preponderance of data and research demonstrates the positive effectiveness of compliant helmets. NHTSA has determined that motorcycle helmets are 37 percent effective in preventing fatalities [90] and 35 percent effective in preventing head injuries [91] to motorcycle riders. The agency estimates that motorcycle helmets have saved 1,800 lives in 2008 and an additional 823 lives would have been saved in that year had helmet use been 100 percent.[92]

Using the Crash Outcome Data Evaluation System (CODES) data files from 18 States, the agency examined the relationship between motorcycle helmet use and motorcycle crash outcomes in terms of head/face injuries and societal costs. In this data set, 6.6 percent of unhelmeted motorcyclists suffered a moderate to severe head or facial injury compared to 5.1 percent of helmeted motorcyclists. Unhelmeted motorcyclists sustained more severe head injuries than helmeted motorcyclists and as a result incurred higher hospital charges and societal costs associated with rehabilitation and lost work time. This study estimated that motorcycle helmets are 35 percent effective at preventing head injuries and 27 percent effective at preventing traumatic brain injury. While helmets were found to effectively mitigate head and face injuries, their use was not found to increase neck, thorax, or other body injuries. There were very few neck injuries in this data set with 0.04 percent unhelmeted motorcyclists and 0.07 percent helmeted motorcyclists sustaining moderate to severe neck injuries. There was also no significant difference in injury rate and severity levels between unhelmeted and helmeted motorcyclists for the neck, thorax, abdomen, and extremity regions.

An analysis of linked data files of FARS and Multiple Cause of Death (MCOD) [93] for the years 2000–2002 showed that among 8,539 motorcyclists (4,412 helmeted motorcyclists, 3,829 unhelmeted motorcyclists, and 298 motorcyclists with unknown helmet use) 51 percent of unhelmeted riders suffered a head injury as compared to about 35 percent of the helmeted riders. In addition, 83 percent of unhelmeted motorcyclist fatalities were attributed to head injuries, while 63 percent of helmeted motorcyclist fatalities were attributed to head injuries. Neck, thorax, and abdomen injuries were attributed to the cause of death in 3, 9, and 4 percent of fatally injured unhelmeted motorcyclists, respectively and to 7, 21, and 8 percent of fatally injured helmeted motorcyclists, respectively. This data shows that head injury is the predominant cause of death among motorcyclists and that death due to head injuries is 20 percent lower among helmeted motorcyclists than among unhelmeted motorcyclists. The higher proportion of injuries to other body regions that are attributed to the cause of death among helmeted motorcyclists is due to the concomitant lower proportion of fatalities attributed to head injuries and is not an indication that helmet use causes injuries to these other body regions, including the neck, thorax, and abdomen. Instead, helmet use increases the survival rate to the point that more neck, thoracic, and abdominal injuries are detected.

Contrary to the claims of helmet opponents, helmeted motorcyclists are less likely than unhelmeted motorcyclists to suffer a cervical spine (neck) injury as a result of a motorcycle crash. These claims are based on a single, well-refuted study. The Insurance Institute for Highway Safety addressed [94] that study as follows:

> Claims have been made that helmets increase the risk of neck injury and reduce peripheral vision and hearing, but there is no credible evidence to support these arguments. A study by J.P. Goldstein often is cited by helmet opponents as evidence that helmets cause neck injuries, allegedly by adding to head mass in a crash. More than a dozen studies have refuted Goldstein's findings. A study reported in the Annals of Emergency Medicine in 1994 analyzed 1,153 motorcycle crashes in four Midwestern states and determined that "helmets reduce head injuries without an increased occurrence of spinal injuries in motorcycle trauma."

(Footnotes omitted.)

More recent information further refutes that single study. Based on a retrospective analysis of all registered cases (62,840) of motorcycle collision in the National Trauma Data Bank that occurred between 2002 and 2006, the authors of a 2010 study found that helmeted motorcyclists had lower adjusted odds and a lower proportion of cervical spine injury than unhelmeted ones.[95]

[89] Comment from Dennis Salter, Docket NHTSA 2008–0157–0025.

[90] Motorcycle Helmet Effectiveness Revisited, March 2004, DOT HS 809 715, Technical Report, National Center for Statistics and Analysis, NHTSA.

[91] Motorcycle Helmet Use and Head and Facial Injuries: Crash Outcomes in CODES-Linked DATA, DOT HIS 811 208, NCSA Technical Report, NHTSA, October 2009.

[92] Lives Saved in 2008 by Restraint Use and Minimum Drinking Age Laws, DOT HS 811 153, May 2010.

[93] Subramanian, R., Bodily Injury Locations in Fatally Injured Motorcycle Riders, DOT HS 810 856.

[94] "Q&As: Motorcycle Helmet Use Laws, Insurance Institute for Highway Safety," available at *http://www.iihs.org/research/qanda/helmet_use.html* (Last accessed March 16, 2011).

[95] Crompton, J. G., Bone, C., Oyetunji, T., Pollack, K., Bolorunduro, O., Villegas, C., Stevens, K.,

The agency evaluated the effect of motorcycle helmet law repeal on motorcyclist fatalities in Florida,[96] Kentucky, Louisiana,[97] Texas, and Arkansas.[98] The evaluation showed a significant drop in helmet use and concomitant increase in fatalities and head injuries among motorcyclists after the repeal of helmet use laws in each of these States. Motorcyclist fatalities increased by 81 percent and motorcyclist hospital admissions for head injuries increased by 82 percent in Florida after the repeal. This increase in motorcyclist fatalities after the repeal of helmet laws in Florida was more than 40 percent higher than the national average for those years and was greater than the increase in motorcycle registrations and the vehicle miles travelled. Similar results were observed in Kentucky, Louisiana, Texas, and Arkansas after helmet laws were repealed.

The data presented in this section clearly demonstrate that the predominant cause of motorcyclist fatalities is injury to the head and that helmet use significantly reduces the risk of head injuries. The effect of helmet use on the risk of injury to other body regions is small or nonexistent. As a result, the benefits of helmet use far outweigh any disbenefits that may arise.

5. Allegations That Helmets Reduce Vision and Hearing

Some opponents of helmet use allege that helmets reduce vision and hearing. Neither of these allegations have merit.

Regarding claims that helmets obstruct vision, full-coverage helmets create only very minor and inconsequential restrictions in horizontal peripheral vision. Normal peripheral vision is between 100° and 110° to the left, and 100° and 110° to the right, of straight ahead.[99] Standard No. 218 requires that helmets provide 105° of vision to the left and 105° to the right.[100] Since over 90 percent of crashes happen within a range of 80° to the left or to the right (with the majority of the remainder occurring in rear-end collisions), it is clear that helmets do not affect peripheral vision or contribute to crashes. Further, a 1994 study found that wearing helmets does not restrict the likelihood of seeing a vehicle in an adjacent lane prior to initiating a lane change.[101] The test subjects compensated for the slight narrowing of the field of vision due to helmet use by rotating their heads slightly farther prior to making a lane change with no resulting reduction in the likelihood of their detecting a vehicle in an adjacent lane.

The allegation regarding effects on hearing is also contradicted by the 1994 study. In addition to examining the effect of wearing a helmet on the ability of motorcycle riders operating at normal highway speeds to visually detect the presence of vehicles in adjacent lanes before changing lanes, it also examined the effect on riders' ability to detect traffic sounds. While helmet use had no significant effect on hearing, wind speed did. As motorcycle speed and thus wind speed increased, the ability of both helmeted *and* unhelmeted riders to detect auditory signals was reduced.

6. Impact of Traumatic Brain Injury on Family, Friends and Co-Workers

Helmet use opponents argue that they are willing to bear the risks of their non-use of helmets and therefore should be given the freedom to do so.

However, no man is an island. The wish of helmet opponents to ride unprotected should be weighed together with the impact of traumatic brain injury on family, friends and co-workers. Helmet opponents do not alone bear the consequences of the risks they wish to assume, *i.e.,* suffering traumatic brain injury as a result of riding unhelmeted. The interrelatedness of the brain-injured persons, regardless of the sources or circumstances of injury, was addressed at a conference held under the auspices of the National Institutes of Health:[102]

Traumatic brain injury (TBI), broadly defined as brain injury from externally inflicted trauma, may result in significant impairment of an individual's physical, cognitive, and psychosocial functioning. In the United States, an estimated 1.5 to 2 million people incur TBI each year, principally as a result of vehicular incidents, falls, acts of violence, and sports accidents. The number of people surviving TBI with impairment has increased significantly in recent years, which is attributed to faster and more effective emergency care, quicker and safer transportation to specialized treatment facilities, and advances in acute medical management. TBI affects people of all ages and is the leading cause of long-term disability among children and young adults.

Each year, approximately 70,000 to 90,000 individuals incur a TBI resulting in a long-term, substantial loss of functioning. The consequences of TBI include a dramatic change in the individual's life-course, profound disruption of the family, enormous loss of income or earning potential, and large expenses over a lifetime. There are approximately 300,000 hospital admissions annually for persons with mild or moderate TBI, and an additional unknown number of traumatic brain injuries (TBIs) that are not diagnosed but may result in long-term disability.

Although TBI may result in physical impairment, the more problematic consequences involve the individual's cognition, emotional functioning, and behavior. These impact interpersonal relationships, school, and work. Cognitive-behavioral remediation, pharmacologic management, assistive technology, environmental manipulation, education, and counseling are among currently used treatments of these sequelae. These treatments are provided in freestanding rehabilitation hospitals, rehabilitation departments in general hospitals, a variety of day treatment or residential programs, skilled nursing facilities, schools, the community, and the home.

7. Recommended Changes to the Helmet Standard

Several commenters, including MIC, ASTM, and Snell, provided extensive recommendations on suggested improvements to the motorcycle helmet standard. These issues included:

- Reduction of the peak allowable headform acceleration from 400 to 300g.
- Impact attenuation tests for full-facial coverage helmets.
- Adoption of face shield tests, based on VESC–8 specifications.[103]
- Elimination of penetration resistance requirements.
- Test procedures for external rigid projections.
- Addition of a positional stability test.

Cornwell III, E. E., Efron, D., Haut, E. R.. "Motorcycle Helmets Associated with Lower Risk of Cervical Spine Injury: Debunking the Myth." Journal of the American College of Surgeons, 2011; DOI: 10.1016/j.jamcollsurg.2010.09.032. Available at *http://www.dor.state.ne.us/nohs/pdf/HelmetsSpine.pdf* (Last accessed March 15, 2011).

[96] Evaluation of the Repeal of the All-Rider Motorcycle Helmet Law in Florida, DOT HS 809 849, August 2005. *http://www.nhtsa.gov/staticfiles/nti/motorcycles/pdf/809849.pdf*

[97] Evaluation of the Repeal of Motorcycle Helmet Laws in Kentucky and Louisiana, DOT HS 809 530, October 2003, *http://www.nhtsa.gov/people/injury/pedbimot/motorcycle/kentuky-la03/index.html*

[98] Evaluation of Motorcycle Helmet Law Repeal in Arkansas and Texas, September 2000, *http://www.nhtsa.gov/people/injury/pedbimot/motorcycle/EvalofMotor.pdf.*

[99] "Without Motorcycle Helmets We all Pay the Price." National Highway Traffic Safety Administration, 2005. *http://www.nhtsa.gov/people/injury/pedbimot/motorcycle/safebike/.* (Last accessed March 16, 2011.)

[100] S5.4 *Configuration* of Standard No. 218 provides: * * * The helmet shall provide peripheral vision clearance of at least 105° to each side of the mid-sagittal plane, when the helmet is adjusted as specified in S6.3. * * *

[101] McKnight, A. J. and McKnight, A. S., "The Effects of Motorcycle Helmets Upon Seeing and Hearing." February 1994 (DOT HS 808 399).

[102] National Institutes of Health Consensus Development Conference Statement, Rehabilitation of Persons with Traumatic Brain Injury, October 26–28, 1998. Available at *http://www.nichd.nih.gov/publications/pubs/TBI_1999/NIH_Consensus_Statement.cfm.* (Last visited March 15, 2011)

[103] Vehicle Equipment Safety Commission, Regulation VESC–8, "Minimum Requirements for Motorcyclists' Eye Protection," July 1980.

• New means to measure helmet velocity.

• Reconsideration of the time duration criteria of the impact attenuation test.

Further, several commenters requested that a FMVSS No. 218 Advisory Committee should be created to confer with NHTSA and to facilitate more regular updates of the standard.

Because this rulemaking action is limited in scope to labeling upgrades and minor clarifications of test conditions and procedures for purposes of improving testing and enforceability, we are not making any of the substantive changes that these commenters requested at this time. We will continue to assess whether additional improvements should be made to the standard in the future.

8. Compliance Date

In the NPRM, the agency proposed a lead time of two years for the new requirements to become effective. We noted that the changes were such that helmet manufacturers should not have to purchase new test equipment or make any structural changes to their helmets to ensure compliance with the revised tests or updated SAE Recommended Practice J211. As the only changes being made to the standard are moderate changes to the labeling requirements and slight clarifications to test conditions and procedures to facilitate enforcement, we continue to believe that two years is adequate lead time. In response, MIC requested that the final rule be clarified to state that it will apply to helmets manufactured two years after publication of the final rule. MIC has correctly stated how the amended standard will apply. We do not believe the regulatory text needs to be modified to provide additional clarity on this point.

IV. Estimated Costs and Benefits

The total benefits deriving from this final rule depends upon how many motorcycle riders in States having motorcycle helmet use laws ("Law States") will change from using noncompliant helmets (novelty helmets) to FMVSS No. 218-certified helmets. As NHTSA does not have a reliable method of estimating how many riders may switch based on this final rule, we have created three reference scenarios, reflecting conditions where different numbers of users switched from novelty helmets to FMVSS No. 218-compliant helmets. Because we expect that most of the effects of this rule will come from the improved enforcement due to the labeling changes, we have limited the potential pool of switching riders to those in States with universal helmet laws. As the three scenarios show, while the scale of the overall costs and benefits changes dramatically depending on how many riders switch, the net cost per life saved remains relatively constant in all scenarios.

The estimated benefits are as follows. If 5 percent of the novelty helmet users in universal helmet law States make a switch (*i.e.,* the 5-percent scenario), the rule would save 22 to 38 lives. Under the 10-percent scenario, the final rule would save 44 to 75 lives. The rule would potentially save a maximum of 438 to 754 lives if all novelty helmet users in States with universal helmet laws switched to compliant helmets. Due to relatively small sample of non-fatal head injuries to fatal head injuries, the impact of the rule on non-fatal head injuries would be negligible.

There are two components to the total cost of the final rule. These are the incremental cost to manufacturers for implementing the recommended labeling requirements and the incremental cost to novelty helmet users who switch to use a FMVSS No. 218-certified helmet. With regard to the increased costs of labeling, the cost to manufacturers is estimated to be two cents per helmet. We do not believe that the other changes to the standard will result in significant costs to manufacturers or testers of helmets. For a total estimate of 5.2 million certified helmets manufactured per year, the cost translates to $0.1 million.

With regard to the costs to consumers, the incremental cost per replaced novelty helmet is estimated to be $46.02. Annually, an estimated 45,979, 91,958, and 919,579 novelty helmets sold in States with universal helmet laws would be replaced by compliant helmets for the 5-, 10-, and 100-percent scenarios, respectively. The corresponding total cost to novelty helmet users who switch to compliant helmets would be $2.1, $4.2, and $42.3 million. Considering the two factors, the total costs of the final rule would be:

• $2.2 million for the 5-percent scenario (= $0.1 + $2.1 million)

• $4.3 million for the 10-percent scenario (= $0.1 + $4.2 million)

• $42.4 million for the 100-percent scenario (= $0.1 + $42.3 million).

No matter what scenario is used, the net cost per equivalent life saved, discounted at a 3 percent and 7 percent discount rate, is less than $150,000. The net cost per equivalent life saved is estimated to range from $62,479 to $110,998 at a 3 percent rate and $71,180 to $130,586 at a 7 percent discount rate. The higher bound is from the 100-percent scenario and the lower bound is from the 5-percent scenario. These figures are well below the $6.23 million per life saved threshold that the agency generally takes into consideration when promulgating rulemaking.

TABLE 12—NET COST PER EQUIVALENT LIFE SAVED BY THREE SCENARIOS

[2008 dollars]

Scenarios	3% Discount rate		7% Discount rate	
	Low	High	Low	High
5-Percent	$65,293	$110,998	$73,998	$130,586
10-Percent	63,763	108,398	73,490	123,883
100-Percent	62,479	107,673	71,180	122,610

NHTSA has also conducted a net benefit analysis for this final rule. A net benefit analysis differs from a cost effectiveness analysis in that it requires that benefits be assigned a monetary value. This benefit value is compared to the monetary value of costs to derive a net benefit. The net benefits can range from $103.8 to $4,190.8 million. The lower range of the net benefits represents the benefit of the final rule for the 5-percent scenario using a 7 percent discount rate and the high end represents the maximum potential benefits using a 3 percent discount rate. Both of these are based on a $6.1 million comprehensive value for preventing a fatality, adjusted to $6.23 million to account for inflation.

TABLE 13—NET BENEFITS WITH $6.23 M COMPREHENSIVE COST PER LIFE

[In millions of 2008 dollars]

Scenarios	At 3% discount rate		At 7% discount rate	
	Low	High	Low	High
5-Percent	$122.5 M	$209.8 M	$103.8 M	$184.8 M
10-Percent	245.0 M	419.6 M	213.9 M	363.5 M
100-Percent	2,414.0 M	4,190.8 M	2,114.7 M	3,673.3 M

V. Related Issues for Future Action

While this final rule will make it easier for State and local law enforcement officials to enforce State laws requiring the use of FMVSS No. 218-compliant helmets, the agency anticipates that only a low percentage of motorcyclists using novelty helmets in States that have a universal helmet use law will switch to using compliant helmets. The agency's survey data indicates that in 2010, 22 percent of motorcyclists in States with a universal helmet use law wore novelty helmets while this was 11 percent in 2009. The popularity of novelty helmets may be related to a variety of factors, including opposition of some motorcyclists to helmet use laws, the lower cost of novelty helmets compared to compliant helmets, marketing strategies, and the ease of purchasing novelty helmets. Even in states with universal helmet use laws, motorcyclists are purchasing novelty helmets for on-road use despite disclaimers by retailers and manufacturers of novelty helmets stating that they are not intended for on-road use and are not protective gear and despite general knowledge among most motorcyclists in those states that wearing a novelty helmet does not meet those laws. As the Governors Highway Safety Association noted in its comments,

> [T]there is a growing problem with evasion of mandatory motorcycle laws in all states. Novelty helmets use is popular among a large segment of motorcycle riders, and these helmets do not meet FMVSS 218 standards, nor are they in compliance with a state's motorcycle helmet law. Many of these riders use the novelty helmets as a means of expressing displeasure with mandatory motorcycle helmet laws. They are also using counterfeit "DOT" stickers on these helmets so as to appear to be in compliance with the federal standards when, in fact, they are not in compliance. * * *
>
> * * * * *
>
> GHSA applauds the National Highway Traffic Safety Administration for promulgating this NPRM and directly addressing a problem that is a growing and pervasive one. Developing a regulation in the face of a vocal minority that opposes helmet laws and flagrantly violates those laws is not an easy task. We encourage the Agency to move forward and finalize this NPRM as quickly as possible so that helmet manufacturers can begin to produce helmets that meet the new standards and law enforcement officers will have the information they need to enforce improper helmet use.

Therefore, in order to increase further the percentage of motorcyclists who wear helmets that provide adequate head impact protection, the agency is assessing other actions that should be taken to address the marketing and selling of novelty helmets to motorcyclists for on-road use. In making that assessment, the agency is considering a variety of issues, including the following ones.

a. Are there examples of novelty "safety" equipment other than novelty helmets?

The agency is unaware of any motor vehicle equipment manufacturers that produce both compliant and "novelty" noncompliant versions of those items of equipment. For example, manufacturers of seat belts that comply with FMVSS No. 209, "Seat belt assemblies," or child seats that comply with FMVSS Nos. 213, "Child restraint systems," and 225, "Child restraint anchorage systems," do not also produce "novelty" seat belts or child seats that they declare, explicitly or implicitly, are not intended to provide protection, are not motor vehicle equipment subject to the FMVSSs and do not comply with them. Likewise, the agency is unaware of any manufacturers that produce only novelty safety belts or child seats. In either case, it is difficult to imagine any manufacturer, importer or seller of seat belts or child seats arguing that their seat belts or child seats are not motor vehicle equipment and making statements similar to the following disclaimer about their seat belts—

> Novelty seat belts are intended for display. They are not intended to be used in motor vehicles and are not designed to provide protection in a crash. Their use in a crash may result in serious injury. Use this seat belt at your own risk.

or child seats—

> Novelty child seats are intended for display. They are not intended to be used in motor vehicles and are not designed to provide protection in a crash. Their use in a crash may result in serious injury. Use this child seat at your own risk.

b. Where are novelty helmets manufactured?

Although novelty helmets are typically not labeled with either the name or location of their manufacturer, the agency believes that few of the novelty helmets are manufactured in the United States. NHTSA believes that a very high percentage of them are, instead, manufactured in South Asia or Southeast Asia.

c. How do novelty helmet manufacturers, importers and dealers attempt to rationalize their manufacture, importation and sale of noncompliant, non-protective helmets?

Despite widespread knowledge among motorcyclists that novelty motorcycle helmets do not meet federal safety performance requirements and are used nevertheless primarily by motorcyclists while riding on public roads and highways, importers and sellers of novelty helmets continue to produce, import and sell novelty motorcycle helmets. Although novelty motorcycle helmets are—

(1) Often either sold online on the same Web sites, even the same webpages, as FMVSS No. 218 compliant helmets, or by businesses that also sell motorcycles or motorcycle related products,

(2) documented by NHTSA as being used by as many as 22 percent (2010) of motorcyclists in States with motorcycle helmet use laws, and

(3) only minimally used for any purpose other than while riding a motorcycle, sellers of novelty helmets provide disclaimers like the following one to consumers:

> Novelty motorcycle helmets are for display or show purposes only. They are not intended to be used in motor vehicles and are not designed to provide protection in a crash. Their use in a crash may result in serious injury. Use at your own risk.

At least some novelty helmet manufacturers affix to their helmets a label bearing similar statements. Novelty helmet manufacturers do not,

however, typically affix any sort of label identifying themselves as the manufacturers. In contrast, manufacturers of compliant helmets attach a label to each of their helmets clearly identifying themselves, as required by FMVSS No. 218.

d. Is it permissible to sell noncompliant helmets in a state that does not have a law requiring the use of helmets?

If a type of equipment is an item of "motor vehicle equipment" within the meaning of the Vehicle Safety Act [104] and is subject to a FMVSS, but does not comply with that standard, it is impermissible to manufacture, import or sell that equipment in any state in the United States, regardless of whether that state requires the use of such equipment for some or all motorcyclists.

VI. Rulemaking Analyses and Notices

a. Executive Orders 12866 and 13563 and DOT Regulatory Policies and Procedures

This rulemaking action amends FMVSS No. 218 to help reduce the use of novelty helmets and improve enforceability of that Standard. This action was not reviewed by the Office of Management and Budget under E.O. 12866 and E.O. 13563. The agency has considered the impact of this action under the Department of Transportation's regulatory policies and procedures (44 FR 11034; February 26, 1979), and has determined that it is not "significant" under them.

NHTSA has prepared a final regulatory evaluation for this action that discusses its potential benefits, costs, and other impacts. A summary of those impacts appears immediately before this section. A copy of the evaluation has been placed in the docket for this rulemaking action.

The evaluation suggests several aspects of this action that could directly or indirectly result in costs to consumers or industry. First, the agency believes that this rule will indirectly induce 5 to 10 percent of novelty helmet users, in States that have a universal helmet use law, to make a switch to purchase and use FMVSS No. 218-compliant helmets. We believe this is a reasonable assumption given that this rule will make it easier for law enforcement personnel to distinguish between helmets that have been certified to FMVSS No. 218 and novelty helmets to which misleading look-alike "certification" labels have been attached by users to create the misleading appearance of a certified helmet. This greater ease of identification is expected to lead to greater enforcement efforts and thus increased compliance with State motorcycle helmet use laws.

Second, this action amends labeling requirements that will cause helmet manufacturers to bear minimal costs and will not necessitate any changes to existing designs. The agency estimates that the cost of the labeling requirement will not exceed $0.02 per helmet.

Third, this rule adds tolerances to the compliance tests of FMVSS No. 218 and clarifies language in the standard to provide clear guidance to manufacturers on conducting compliance tests and to enable the agency to better undertake enforcement actions when a noncompliance is discovered. However, we do not believe that it will result in significant expenses or changes in helmet design or manufacture or testing procedures. Further information about the benefits and costs of this rulemaking action may be found above in Section IV of this preamble.

b. Regulatory Flexibility Act

Pursuant to the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.,* as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever an agency is required to publish a notice of proposed rulemaking or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (*i.e.,* small businesses, small organizations, and small governmental jurisdictions). The Small Business Administration's regulations at 13 CFR part 121 define a small business, in part, as a business entity "which operates primarily within the United States." (13 CFR 121.105(a)). No regulatory flexibility analysis is required if the head of an agency certifies the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the Regulatory Flexibility Act to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have a significant economic impact on a substantial number of small entities.

NHTSA has considered the effects of this final rule under the Regulatory Flexibility Act. This rule imposes minimal cost burdens on helmet manufacturers, on the order of 2 cents per helmet. While the costs of designing a unique certification label for each model of helmet depend on the number of units of the model manufactured and sold (and therefore may cost more on a per-helmet basis for small manufacturers), the costs are still minimal compared to the overall cost of manufacturing a compliant motorcycle helmet. I certify that this proposed rule would not have a significant economic impact on a substantial number of small entities.

c. Executive Order 13132 (Federalism)

NHTSA has examined today's final rule pursuant to Executive Order 13132 (64 FR 43255, August 10, 1999) and concluded that no additional consultation with States, local governments or their representatives is mandated beyond the consultation already conducted and the rulemaking process.

The agency's proposals regarding the issue of misleading labels on novelty helmets are based on substantial analysis of the needs of law enforcement personnel and the concerns of manufacturers. In 2005, NHTSA's Office of Traffic Injury Control and Office of Vehicle Safety Compliance conducted an informal telephone survey of seven law enforcement offices,[105] a law enforcement organization,[106] and five motorcycle helmet manufacturers to discuss the problem of misleading "DOT" symbols. Respondents were asked their opinion on various approaches to the problem, the advantages and disadvantages of suggested approaches, and on other changes in the requirements that could help identify noncompliant helmets. Additionally, NHTSA published a Motorcycle Safety Program Plan on July 3, 2006. This plan discussed—among other topics—proposed initiatives to amend FMVSS No. 218 to address the problem of misleading labeling.

In addition, in response to the NPRM, the agency received supportive comments from the Governors Highway Safety Association and the Washington Association of Sheriffs and Police Chiefs. The Governors Highway Safety Association said: [107]

> One of the most effective strategies for reducing motorcycle fatalities is to encourage the use of motorcycle helmets. As noted in the NPRM, motorcycle helmets are 37% effective in reducing fatalities. Few other countermeasures can boast such a high level of effectiveness. GHSA strongly supports mandatory motorcycle helmet laws for all riders and encourages the thirty states without such laws to enact them.

[104] 49 U.S.C. 30102(a)(7).

[105] The seven law enforcement offices surveyed were Pittsburgh Bureau of Police; Louisiana State Police; Pennsylvania Department of Transportation; Canadian Officers; Riverside, California Police Department; Nebraska State Police; and the Maryland Department of Transportation.

[106] The law enforcement organization surveyed was the American Association of Motor Vehicle Administrators, Law Enforcement Committee.

[107] Docket NHTSA–2008–0157–0021.

Not only do many states fail to have the most protective motorcycle helmet laws, there is a growing problem with evasion of mandatory motorcycle laws in all states. Novelty helmets use is popular among a large segment of motorcycle riders, and these helmets do not meet FMVSS 218 standards, nor are they in compliance with a state's motorcycle helmet law. Many of these riders use the novelty helmets as a means of expressing displeasure with mandatory motorcycle helmet laws. They are also using counterfeit "DOT" stickers on these helmets so as to appear to be in compliance with the federal standards when, in fact, they are not in compliance.

NHTSA has recently conducted testing of these noncompliant helmets and found that they do not provide the rider with adequate coverage. The analysis indicated that the novelty helmets provide "minimal protection during a crash." GHSA is also unaware of any evidence to support claims that fake DOT labels are being used for any purposes other than counterfeiting. In short, novelty helmets are dangerous, and bogus DOT stickers are misleading.

It is GHSA's position that all states with mandatory motorcycle helmet laws should enforce them and ensure that motorcycle riders are using DOT-compliant helmets. The Association also strongly supports any changes to FMVSS 218 that would make it easier for law enforcement personnel to enforce their states' motorcycle helmet laws.

Accordingly, GHSA strongly supports the changes in the motorcycling helmet labeling requirements proposed in this NPRM. By requiring a water decal beneath the clear coating for the helmet, the label is more likely to be tamper-proof. It will be easier for law enforcement to determine whether the label was part of the manufacturing process or simply a decal affixed afterwards. By specifying that the manufacturer's name or brand and model designation be included in the outside label and by allowing the manufacturers to use several different formats, it will be more difficult for counterfeit label producers to develop a single bogus decal. By requiring the word "certified," it will put the onus on legitimate manufacturers of helmets to stand by their products and will clarify that "certified" is a modifier to "DOT" and that the "DOT" does not have some other meaning.

The Washington Association of Sheriffs and Police Chiefs provided similarly supportive comments: [108]

* * * WASPC believes the proposed rule changes for FMVSS 218 are reasonable and if approved will help reduce misleading labeling of novelty helmets that creates the impression that uncertified, non-compliant motorcycle helmets have been properly certified as compliant.

The new motorcycle helmet rule changes would help realize the full potential of compliant helmets by assisting law enforcement officers in Washington State with enforcing the state helmet use laws, thereby increasing the percentage of motorcycle riders wearing compliant helmets.

[108] Docket NHTSA–2008–0157–0161.

The use of the motorcycle safety helmet is the single most critical factor in the prevention and reduction of head injuries for motorcycle riders. Safety helmets that comply with FMVSS 218 are a significantly effective injury countermeasure.

The agency has concluded that the rulemaking would not have sufficient federalism implications to warrant further consultation with State and local officials or the preparation of a federalism summary impact statement. The final rule would not have "substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government."

NHTSA rules can preempt in two ways. First, the National Traffic and Motor Vehicle Safety Act contains an express preemption provision: When a motor vehicle safety standard is in effect under this chapter, a State or a political subdivision of a State may prescribe or continue in effect a standard applicable to the same aspect of performance of a motor vehicle or motor vehicle equipment only if the standard is identical to the standard prescribed under this chapter. 49 U.S.C. 30103(b)(1). It is this statutory command by Congress that preempts any non-identical State legislative and administrative law addressing the same aspect of performance.

The express preemption provision described above is subject to a savings clause under which "[c]ompliance with a motor vehicle safety standard prescribed under this chapter does not exempt a person from liability at common law." 49 U.S.C. 30103(e) Pursuant to this provision, State common law tort causes of action against motor vehicle manufacturers that might otherwise be preempted by the express preemption provision are generally preserved. However, the Supreme Court has recognized the possibility, in some instances, of implied preemption of such State common law tort causes of action by virtue of NHTSA's rules, even if not expressly preempted. This second way that NHTSA rules can preempt is dependent upon there being an actual conflict between an FMVSS and the higher standard that would effectively be imposed on motor vehicle manufacturers if someone obtained a State common law tort judgment against the manufacturer, notwithstanding the manufacturer's compliance with the NHTSA standard. Because most NHTSA standards established by an FMVSS are minimum standards, a State common law tort cause of action that seeks to impose a higher standard on motor vehicle manufacturers will generally not be preempted. However, if and when such a conflict does exist—for example, when the standard at issue is both a minimum and a maximum standard—the State common law tort cause of action is impliedly preempted. See *Geier* v. *American Honda Motor Co.,* 529 U.S. 861 (2000).

Pursuant to Executive Order 13132 and 12988, NHTSA has considered whether this rule could or should preempt State common law causes of action. The agency's ability to announce its conclusion regarding the preemptive effect of one of its rules reduces the likelihood that preemption will be an issue in any subsequent tort litigation.

To this end, the agency has examined the nature (*e.g.,* the language and structure of the regulatory text) and objectives of today's rule and finds that this rule, like many NHTSA rules, prescribes only a minimum safety standard. As such, NHTSA does not intend that this rule preempt state tort law that would effectively impose a higher standard on motor vehicle manufacturers than that established by today's rule. Establishment of a higher standard by means of State tort law would not conflict with the minimum standard announced here. Without any conflict, there could not be any implied preemption of a State common law tort cause of action.

d. Executive Order 12988 (Civil Justice Reform)

With respect to the review of the promulgation of a new regulation, section 3(b) of Executive Order 12988, "Civil Justice Reform" (61 FR 4729, February 7, 1996) requires that Executive agencies make every reasonable effort to ensure that the regulation: (1) Clearly specifies the preemptive effect; (2) clearly specifies the effect on existing Federal law or regulation; (3) provides a clear legal standard for affected conduct, while promoting simplification and burden reduction; (4) clearly specifies the retroactive effect, if any; (5) adequately defines key terms; and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. This document is consistent with that requirement.

Pursuant to this Order, NHTSA notes as follows. The preemptive effect of this rule is discussed above. NHTSA notes further that there is no requirement that individuals submit a petition for reconsideration or pursue other administrative proceeding before they may file suit in court.

e. National Technology Transfer and Advancement Act

Under the National Technology Transfer and Advancement Act of 1995 (NTTAA) (Pub. L. 104–113), "all Federal agencies and departments shall use technical standards that are developed or adopted by voluntary consensus standards bodies, using such technical standards as a means to carry out policy objectives or activities determined by the agencies and departments." Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies, such as the Society of Automotive Engineers (SAE). The NTTAA directs us to provide Congress, through OMB, explanations when we decide not to use available and applicable voluntary consensus standards.

FMVSS No. 218 is largely based on ANSI Z90.1–1971, "Specifications for Protective Headgear for Vehicular Users," and incorporates the SAE Recommended Practice J211/1, revised March 1995, "Instrumentation for Impact Test—Part 1—Electronic Instrumentation," both of which are voluntary consensus standards. While the Snell Memorial Foundation also produces helmet specifications (*e.g.,* the 2005 and 2010 Helmet Standards for use in Motorcycling), the agency continues to base its standard on the ANSI specification, as the purpose of this rulemaking action is to make minor changes and clarifications to the standard for labeling and enforcement purposes, and we have not analyzed the effectiveness of the Snell standard.

f. Unfunded Mandates Reform Act

The Unfunded Mandates Reform Act of 1995 requires agencies to prepare a written assessment of the costs, benefits and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local or tribal governments, in the aggregate, or by the private sector, of more than $100 million annually (adjusted for inflation with base year of 1995). This final rule would not result in expenditures by State, local or tribal governments, in the aggregate, or by the private sector in excess of $100 million annually.

g. National Environmental Policy Act

NHTSA has analyzed this rulemaking action for the purposes of the National Environmental Policy Act. The agency has determined that implementation of this action would not have any significant impact on the quality of the human environment.

h. Paperwork Reduction Act

Under the Paperwork Reduction Act of 1995 (PRA), a person is not required to respond to a collection of information by a Federal agency unless the collection displays a valid OMB control number. This final rule does not contain any new reporting requirements or requests for information.

i. Regulation Identifier Number (RIN)

The Department of Transportation assigns a regulation identifier number (RIN) to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. You may use the RIN contained in the heading at the beginning of this document to find this action in the Unified Agenda.

List of Subjects in 49 CFR Part 571

Imports, Incorporation by reference, Motor vehicle safety, Reporting and recordkeeping requirements, Tires, Motorcycle helmets.

In consideration of the foregoing, NHTSA is amending 49 CFR part 571 as follows:

PART 571—FEDERAL MOTOR VEHICLE SAFETY STANDARDS

■ 1. The authority citation for part 571 of Title 49 continues to read as follows:

Authority: 49 U.S.C. 322, 30111, 30115, 30117, and 30166; delegation of authority at 49 CFR 1.50.

■ 2. Amend § 571.5 by revising paragraph (l)(4) to read as follows:

§ 571.5 Matter incorporated by reference.

* * * * *

(l) * * *

(4) SAE Recommended Practice J211/1, revised March 1995, "Instrumentation for Impact Test—Part 1—Electronic Instrumentation" into §§ 571.202a; 571.208; 571.218; 571.403.

* * * * *

■ 3. § 571.218 is amended by adding two definitions in alphabetical order in S4, by adding S5.6.2, by revising S5.6.1, S6.4.1, S7.1.2, S7.1.4(a) and (b), S7.1.9, S7.2.4, S7.2.6, S7.2.7, S7.3.1, and S7.3.2, and by revising Table 1, Figure 7, and Figure 8 to read as follows:

§ 571.218 Standard No. 218; Motorcycle Helmets.

* * * * *

S4 *Definitions*

* * * * *

Discrete size means a numerical value that corresponds to the diameter of an equivalent circle representing the helmet interior in inches (± 0.25 inch) or to the circumference of the equivalent circle in centimeters (± 0.64 centimeters).

* * * * *

Impact site means the point on the helmet where the helmet shell first contacts the test anvil during the impact attenuation test.

* * * * *

S5.6.1 On a label or labels separate from the certification label required by S5.6.2, each helmet shall be labeled permanently and legibly, in a manner such that the label(s) can be read easily without removing padding or any other permanent part, with the following:

(a) Manufacturer's name.

(b) Discrete size.

(c) Month and year of manufacture. This may be spelled out (for example, June 2010), or expressed in numerals (for example, 6/10).

(d) Instructions to the purchaser as follows:

(1) "Shell and liner constructed of (identify type(s) of materials)."

(2) "Helmet can be seriously damaged by some common substances without damage being visible to the user. Apply only the following: (Recommended cleaning agents, paints, adhesives, etc., as appropriate)."

(3) "Make no modifications. Fasten helmet securely. If helmet experiences a severe blow, return it to the manufacturer for inspection, or destroy it and replace it."

(4) Any additional relevant safety information should be applied at the time of purchase by means of an attached tag, brochure, or other suitable means.

S5.6.2 Certification. Each helmet shall be labeled permanently and legibly with a label, constituting the manufacturer's certification that the helmet conforms to the applicable Federal motor vehicle safety standards, that is separate from the label(s) used to comply with S5.6.1, and complies with paragraphs (a) through (c) of this section.

(a) Content, format, and appearance. The label required by paragraph S5.6.2 shall have the following content, format, and appearance:

(1) The symbol "DOT," horizontally centered on the label, in letters not less than 0.38 inch (1.0 cm) high.

(2) The term "FMVSS No. 218," horizontally centered beneath the symbol DOT, in letters not less than 0.09 inches (0.23 cm) high.

(3) The word "CERTIFIED," horizontally centered beneath the term

"FMVSS No. 218," in letters not less than 0.09 inches (0.23 cm) high.

(4) The precise model designation, horizontally centered above the symbol DOT, in letters and/or numerals not less than 0.09 inch (0.23 cm) high.

(5) The manufacturer's name and/or brand, horizontally centered above the model designation, in letters and/or numerals not less than 0.09 inch (0.23 cm) high.

(6) All symbols, letters and numerals shall be in a color that contrasts with the background of the label.

(b) Other information. No information, other than the information specified in subparagraph (a), shall appear on the label.

(c) Location. The label shall appear on the outer surface of the helmet and be placed so that it is centered laterally with the horizontal centerline of the DOT symbol located a minimum of 1 inch (2.5 cm) and a maximum of 3 inches (7.6 cm) from the bottom edge of the posterior portion of the helmet.

* * * * *

S6.4.1 Immediately before conducting the testing sequence specified in S7, condition each test helmet in accordance with any one of the following procedures:

(a) *Ambient conditions.* Expose to any temperature from 61 °F to and including 79 °F (from 16 °C to and including 26 °C) and any relative humidity from 30 to and including 70 percent for a minimum of 4 hours.

(b) *Low temperature.* Expose to any temperature from 5 °F to and including 23 °F (from −15 °C to and including −5 °C) for a minimum of 4 hours and no more than 24 hours.

(c) *High temperature.* Expose to any temperature from 113 °F to and including 131 °F (from 45 °C to and including 55 °C) for a minimum of 4 hours and no more than 24 hours.

(d) *Water immersion.* Immerse in water at any temperature from 61 °F to and including 79 °F (from 16 °C to and including 26 °C) for a minimum of 4 hours and no more than 24 hours.

* * * * *

S7.1.2 Each helmet is impacted at four sites with two successive impacts at each site. Two of these sites are impacted upon a flat steel anvil and two upon a hemispherical steel anvil as specified in S7.1.10 and S7.1.11. The impact sites are at any point on the area above the test line described in paragraph S6.2.3, and separated by a distance not less than one-sixth of the maximum circumference of the helmet in the test area. For each site, the location where the helmet first contacts the anvil on the second impact shall not be greater than 0.75 inch (1.9 cm) from the location where the helmet first contacts the anvil on the first impact.

* * * * *

S7.1.4(a) The guided free fall drop height for the helmet and test headform combination onto the hemispherical anvil shall be such that the impact speed is any speed from 16.4 ft/s to and including 17.7 ft/s (from 5.0 m/s to and including 5.4 m/s).

(b) The guided free fall drop height for the helmet and test headform combination onto the flat anvil shall be such that the impact speed is any speed from 19.0 ft/s to and including 20.3 ft/s (from 5.8 m/s to and including 6.2 m/s).

* * * * *

S7.1.9 The acceleration transducer is mounted at the center of gravity of the test headform with the sensitive axis aligned to within 5° of vertical when the test headform assembly is in the data impact position. The acceleration data channel complies with the SAE Recommended Practice J211/1, revised March 1995 (incorporated by reference, see § 571.5) requirements for channel class 1,000."

* * * * *

S7.2.4 The height of the guided free fall is 118.1 ± 0.6 in (3 ± 0.015 m), as measured from the striker point to the impact point on the outer surface of the test helmet.

* * * * *

S7.2.6 The weight of the penetration striker is not less than 6 pounds, 8 ounces and not more than 6 pounds, 12 ounces (2.95 to 3.06 kg).

S7.2.7 The point of the striker has an included angle of 60 ± 0.5°, a cone height of 1.5 ± 0.015 in. (3.8 ± 0.038 cm), a tip radius of 0.02 ± 0.004 in. (0.5 ± 0.1 mm), and a minimum hardness of 60 Rockwell, C-scale.

* * * * *

S7.3.1 The retention system test is conducted by applying a quasi-static tensile load at any rate from 0.4 to and including 1.2 inch/min (from 1.0 to and including 3.0 cm/min) to the retention assembly of a complete helmet, which is mounted, as described in S6.3, on a stationary test headform as shown in Figure 4, and by measuring the movement of the adjustable portion of the retention system test device under tension.

S7.3.2 The retention system test device consists of both an adjustable loading mechanism by which a quasi-static tensile load is applied at any rate from 0.4 to and including 1.2 inch/min (from 1.0 to and including 3.0 cm/min) to the helmet retention assembly and a means for holding the test headform and helmet stationary. The retention assembly is fastened around two freely moving rollers, both of which have a 0.5 inch (1.3 cm) diameter and a 3 inch (7.6 cm) center-to-center separation, and which are mounted on the adjustable portion of the tensile loading device (Figure 4). The helmet is fixed on the test headform as necessary to ensure that it does not move during the application of the test loads to the retention assembly.

* * * * *

TABLE 1—WEIGHT RANGES FOR IMPACT ATTENUATION TEST DROP ASSEMBLY

Test headform size	Weight range [1]—lb kg)
Small	7.6–8.0 (3.4–3.6)
Medium	10.8–11.2 (4.9–5.1)
Large	13.2–13.6 (6.0–6.2)

[1] Combined weight of instrumented test headform and supporting assembly for drop test.

* * * * *

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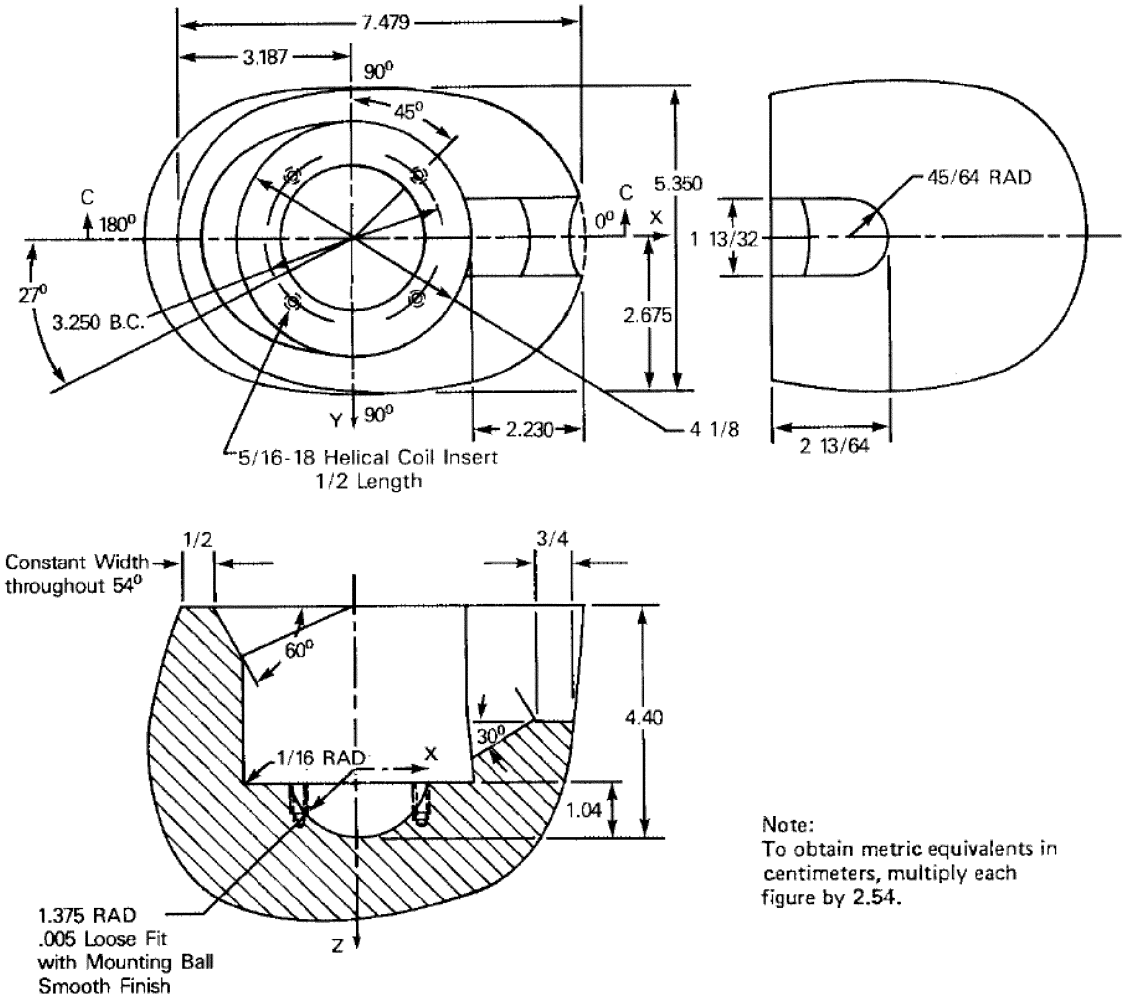
Figure 7

Medium Headform – Interior Design

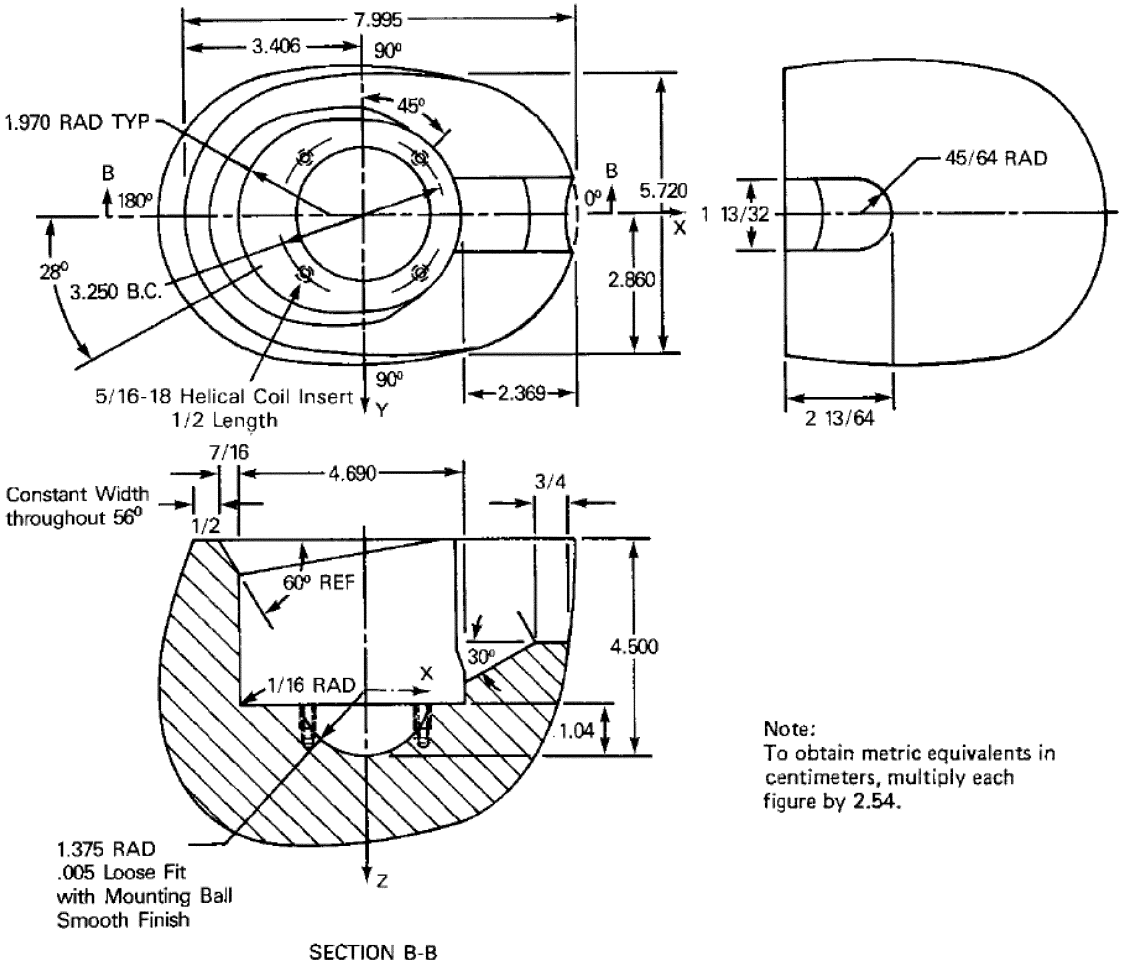


Section C-C

Note:
To obtain metric equivalents in centimeters, multiply each figure by 2.54.

Figure 8

Large Headform – Interior Design



Issued: May 3, 2011.

David L. Strickland,

Administrator.

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