UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
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Memorandum

Date: JUN 30 2006

TO : The Commission
Todd A. Stevenson, Secretary

THROUGH: Page Faulk, General Counsel
Patricia Semple, Executive Director

FROM : Jacqueline Elder, Assistant Executive Director for Hazard Identification and Reduction
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SUBJECT : CPSC Staff Response Regarding Follow-Up Questions from Commissioner Nancy Nord after the June 15, 2006, ATV Safety Review Briefing

Introduction

On June 15, 2006, the U.S. Consumer Product Safety Commission (CPSC) staff briefed the Commission on the results of its review of all-terrain vehicle (ATV) safety standards and proposals. After the briefing, Commissioner Nancy Nord sent follow-up questions to the staff. The following is the staff response to those questions.

Responses to Questions

1. Training. As currently drafted, the proposed rule does not have a requirement that training be provided within a reasonable time and a reasonable distance from the date and place of purchase of the ATV. In response to a question, it was stated that it was implicit that the training be reasonably available. Would not an explicit "reasonableness" requirement minimize the potential for manufacturers and distributors to offer only sparse training for purchasers?

Response:

No information is available to indicate that the staff's draft proposed rule would or would not cause manufacturers and distributors to offer only sparse training. There is information available, however, to indicate that the average purchaser of an ATV who decides to take training has probably owned the ATV for seven and a half weeks before he or she receives training. It is possible that improvements could be made in the accessibility of training, both in terms of distance and timing. However, while an explicit reasonableness requirement could minimize the potential for manufacturers and distributors to only maintain or to cut back on the current availability of training, staff does not have information at this time to establish specific time and distance parameters for a reasonableness requirement.

[redacted]
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NOTE: This document has not been reviewed or accepted by the Commission.
Initial MEL Date 6/30/06

The Commission could add to the staff's draft proposed rule a requirement concerning course accessibility stating that the training course shall be provided within a reasonable time from the date of purchase of the ATV and a reasonable distance from the place of purchase of the ATV, with no specific parameters provided. This could be done in section 1410.5 of the draft proposed adult standard and section 1515.15 of the draft proposed youth standard. With or without such a modification to the draft proposed rule, the Commission could add a brief discussion about training distance and time parameters into the preamble of the draft proposed rule and ask for comments from the public and interested parties. These comments might assist staff in making recommendations as appropriate for inclusion in a final rule.

2. Lateral Stability. Please summarize CPSC's efforts to date to address the issue of lateral ATV stability. Specifically, what main technologies or approaches have been suggested to date to improve the lateral stability of ATVs, and to what degree has staff analyzed or might analyze those to determine if any are feasible as part of a possible standard?

Response:

During the mid-to-late 1980's, CPSC staff performed numerous experimental and analytical studies of ATV stability and handling characteristics. These included:

1. CPSC staff worked with the Specialty Vehicle Institute of America (SVIA)/American National Standards Institute (ANSI) subcommittee to develop a minimum lateral/roll stability coefficient measurement. This is a common vehicle measurement that is based on track width and location of the center of gravity, and it can help predict the tendency of an ATV to roll over. The development of this measurement was considered during the development of the voluntary standard, but time constraints mandated by the Consent Decrees did not allow for consensus agreement on a performance requirement that was acceptable to industry members and CPSC staff, and the effort was discontinued after the publication of the standard.

2. CPSC staff conducted empirical measurement of the tire side forces on various soil and tire interfaces. Tire side force and the stability coefficient are important factors in the analysis of how an ATV operates in a turn. The relationship between the center of gravity location and tire side force capability are the basic parameters that predict an ATV's tendency to roll over versus slide in a turn.

3. CPSC staff and contractors conducted experimental and analytical evaluation of ATV steering response characteristics. Turn circle tests with instrumented ATVs were used to determine the steering control limit. The testing showed that ATVs exhibit both an understeer and oversteer characteristic. CPSC staff concluded that the ATV's unique and complex handling characteristics require a relatively high degree of skill as well as constant attentiveness to operate.

4. Rider input effect was recognized as an important factor on an ATV's lateral stability; however, no standardized tests were developed.

Unlike the automotive industry, there are few established protocols for analyzing ATV characteristics. The original ATV Task Force established in the 1980s performed tests to determine the dynamic and static lateral stability limits of various ATVs. Through this process it was determined that 4-wheel ATVs exhibited higher stability characteristics than 3-wheel ATVs.

In the time since the Consent Decrees, vehicle technology has evolved in terms of brake systems, suspension systems, and engine horsepower. However, CPSC staff is unaware of any technologies that have been suggested to date to improve the lateral stability of ATVs. CPSC staff has not conducted stability testing to determine if lateral stability characteristics have improved. In 1997 CPSC staff test-drove a number of ATVs and qualitatively believed that lateral stability had improved since the 1980s. However, there was no quantified data to support that informal impression, and industry representatives denied that any significant changes had been made in the years since the Consent Decrees became effective.

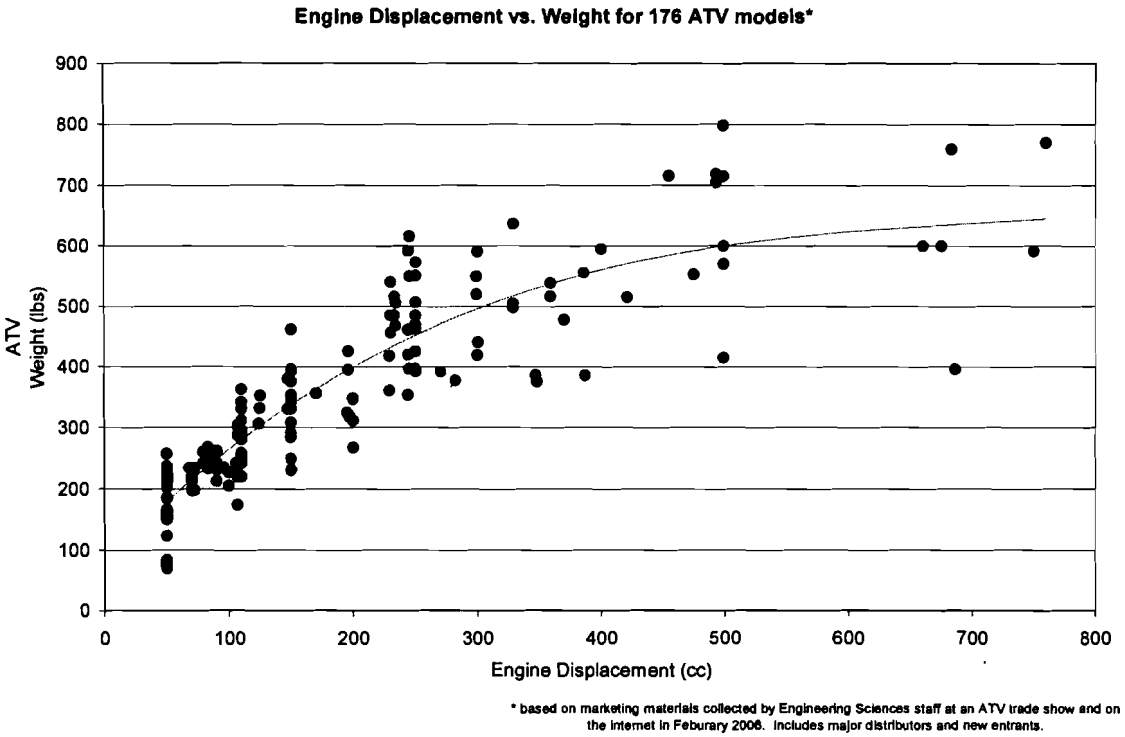
CPSC staff believes that the exploration of a lateral stability requirement is an exceedingly complex task (due to the ATV rider active feature and variable terrain, neither of which is experienced with an on-road four-wheeled vehicle where rider action is not a factor and the vehicle operates on an engineered surface). The effort would require extensive test and evaluation with the cooperation of CPSC, industry and other private sector entities. While initial steps to become familiar with the current generation of ATVs can be accomplished with relative ease and modest resource commitments, further efforts would need to include resource-intensive static and dynamic vehicle tests and a comparative analysis of vehicle performance. These efforts could result in the development of a meaningful test method and pass/fail criteria for lateral stability.

3. Engine/ATV size for youth models. Since engine size does have a positive correlation to the overall size and weight of ATVs, thereby posing a potentially greater risk of crushing death for children, has the staff explored or might it explore combining speed classifications with engine size and/or the overall size and weight for classifying youth ATVs?

Response:

Engine size correlation to size and weight of ATVs

Although there is a generally positive correlation between ATV size/weight and engine size, there is a considerable range of ATV weight for each engine displacement value. The "engine size" reference (such as that stated in the age guidelines) is for engine *displacement* (i.e. cubic centimeters or cc's), not the physical dimensions and weight of the engine. It cannot be assumed, however, that a larger engine displacement ATV is necessarily heavier than a smaller engine displacement ATV. On the next page is a graph of engine displacement plotted against ATV weight for a selection of 176 models for which ES staff had this information. The graph demonstrates that ATV weight varies across similar engine displacements and that the positive correlation does not necessarily mean that every large engine displacement ATV weighs more than every ATV with a smaller engine displacement. Using the current definitions of youth and adult ATVs, there are current adult ATVs that weigh less than some youth ATVs, and some ATVs above 650cc weigh about the same as some ATVs with much smaller engine displacement sizes.



ATV weight and the crushing hazard

The CPSC staff believes there is no weight limit for an ATV that would guarantee against crushing injury hazards. The severity of injury resulting from blunt trauma is dependent upon several factors, including the weight of the object, the rate at which the object load is transferred to the body, the area and location where the applied load of the ATV is applied to body, the orientation of the body upon impact, and the forces generated between the two surfaces during the impact. In addition, after the initial dynamic impact, the severity of injuries is greatly influenced by the duration for which the applied static load of the ATV is sustained on an entrapped child's body. The CPSC staff has reports of deaths from blunt force trauma when a youth ATV, generally the lightest category of ATVs, impacts a child.

Different organs and regions of the body have different degrees of tolerance to physical stress. The most vulnerable parts of the body to compression are the head, chest, and cervical spine. Crush injuries may also result in asphyxia when the chest region is entrapped between two stationary objects. The CPSC staff is aware of one death attributed to asphyxiation while trapped under an ATV; the ATV model reported in the IDI (000905HCN0462) is listed as weighing less than 200 pounds. HS staff considers that a major weight reduction would be needed before it is possible to achieve any significant increase in the survival chances of children who sustain crush injuries to the chest or abdomen.

Determining a proper weight for a youth ATV

There are multiple factors that interact when determining the appropriate weight for a youth ATV. First, the ATV must be sufficiently heavy to reduce the effect a large youth would have on raising the entire system's center of gravity, which can negatively affect stability. At the

present time, we do not have the information available to reach any conclusions about what this weight should be. Secondly, the weight of the ATV ideally should not pose a serious hazard to the child if the ATV were to roll over on the child. This is also a complex relationship, as rollover hazards also depend on the speed of the ATV and the region of the body impacted. Third, the child must be strong enough to physically control the ATV, which may be more difficult with heavier ATVs. Since, however, control will depend on many variables other than strength (speed, weight, terrain, ATV design, etc.), it is difficult to make a recommendation at this point.

Because some of these factors are at odds with each other (i.e., increasing weight may in some cases increase stability but may also increase injury potential during a rollover), developing weight recommendations and limits for youth ATVs would take significant testing, modeling, and optimization. Additionally, it is possible that a heavier machine may mitigate other hazard scenarios that would be present if a youth were to drive a similar size and weight adult ATV with no speed limitations at all. The testing and modeling needed to investigate the interaction between the weight of an ATV and the weight of a rider would require significant resources. Staff believes it would be difficult to arrive at an exact specification for weight or even acceptable weight ranges. The testing needed to develop this information may include tilt table testing, measuring dynamic variables, and/or modeling three-dimensional rider/ATV interaction.

4. Headlights on youth ATVs. The question of whether headlamps and/or other forward-or ground-facing front-end illumination would promote nighttime driving or instead would provide a measure of safety in certain conditions is clearly a difficult one. Do we have any data that would address this aspect of the proposed rule?

Response:

With respect to youth driving youth ATVs, there are very few incidents included in the CPSC data base. CPSC staff, in evaluating 184 in-depth investigations (IDIs) for Petition No.CP-02-4/HP-02-1[1] found nine deaths. A detailed description of these incidents was provided in Tab I of the May 2006 ATV Safety Review briefing package. Of these nine incidents, one child was driving after dark with a passenger. The incident (IDI Number 011120HCC2088) occurred on a public road at about 8:50 p.m. The ATV crossed a state intersection. The passenger fell off the ATV and was then struck by a vehicle traveling in the opposite direction.

CPSC staff has not examined its data to determine if there are any nighttime incidents involving the relatively few youth ATVs that have daytime running lights. Inasmuch as there are few youth ATVs with these lights, it is anticipated that there would be few, if any, incidents in the CPSC data base.

CPSC staff is aware that there are some injuries and fatalities involving children riding adult ATVs (which have headlamps) at night. However, a formal search of the CPSC database for these incidents, and an analysis of them, has not been conducted by CPSC staff.

[1] U.S. Consumer Product Safety Commission staff, Briefing Package, Petition No. CP-02-4/HP-02-1, *Request to Ban All-Terrain Vehicles Sold for Use by Children under 16 Years Old*, February 2005.

In addition to incident data, there are human factors performance data that are relevant to this aspect of the draft proposed rule. Data from the human factors research literature address driver performance for vehicles in general, but are pertinent to driving off-road vehicles as well. The staff used these data to evaluate the relative risk of driving off-road vehicles after dark in terms of both sensory capabilities and situational awareness.

Driver performance suffers under nighttime conditions, even with a well-defined roadway and the relatively high illumination of headlamps, and, often, overhead lighting as well. Research indicates that nighttime driving is riskier than daytime driving, particularly for young drivers. Nighttime risks are exaggerated with ATVs because they are used off-road, where the driver might not see obstacles such as branches, guy-wires, or low overhangs, even if the ground were illuminated. Additionally, color and depth perception are poor in dark conditions, and perhaps counterintuitively, light from headlamps would interfere with dark adaption so that perception of unlit areas to the front and sides of the vehicle would be hampered. This would interfere with accurate perception of terrain changes that are more likely with off-road use. Crash avoidance requires that the driver have sufficient time to detect and identify a hazard, choose how to respond, and execute the response. During off-road use after dark, even with headlamps, sensory input would be dramatically reduced relative to daytime riding, thus shortening the time available to perceive and respond adequately to hazards. The ESHF staff concluded that adding headlamps to youth ATVs would not mitigate the additional risks associated with nighttime driving and would not make nighttime driving safe.

5. <u>Adult death and injury data.</u> The proposed risk disclosure forms require that death and injury data for youth be provided to consumers and that consumers acknowledge that they have received that information. Do we have the authority to require that overall death and injury data (including adults) be provided at point of sale? Would doing so significantly dilute the youth risk message?

Response:

Legal Authority

Death and injury data concerning ATV-related incidents (including those involving adults) could be considered "performance and technical data" under section 27(e) of the Consumer Product Safety Act (CPSA). As discussed in the Office of General Counsel's restricted legal memorandum that was sent to the Commission with the May 2006 briefing package and in the draft preamble to the staff's draft proposed rule, section 27(e) authorizes the Commission to issue a rule requiring consumer product manufacturers to provide "performance and technical data related to performance and safety" to prospective and first purchasers. 15 U.S.C.§ 2076(e).

Effect on Youth Risk Message

In general, consumers are less responsive to individual warnings as the total number of warnings to which they are exposed increases. Thus, if overall death and injury data were presented alongside of youth death, injury, and relative risk data (e.g., within the same form), one would expect the youth risk message to have a smaller impact on one's decision about the appropriateness of adult ATVs for youth. Additionally, the numbers of deaths and injuries for all riders of adult ATVs is larger than those for youth only, so presenting this information together could decrease the perceived risk of adult ATVs to youth. If, on the other hand, purchasers of

adult ATVs are presented overall death and injury data in a separate form and are not required to examine this form until after they have already examined and signed the disclosure form about the increased risk that adult ATVs pose to youth, the dilution of the youth risk message would be reduced. However, a requirement to stage disclosures would be difficult to enforce.

A potentially larger issue is whether providing adult-ATV purchasers with an additional disclosure statement that includes the overall death and injury data would prove beneficial. Warnings and other risk communications generally should be presented to consumers only at the time they are needed and should describe practical actions they can take to avoid or reduce exposure to the identified hazards. For example, the primary benefit of point-of-purchase or point-of-sale safety information is to provide consumers with information that will assist their immediate purchasing decisions. By providing potential purchasers of adult ATVs with the disclosure statement about youth risk, consumers can reduce exposure to the risk by choosing an alternative to an adult ATV: a youth ATV. A similar disclosure statement that includes overall death and injury data, however, would provide consumers with no purchase-relevant means of reducing exposure to the identified hazards other than not purchasing an ATV at all, an option that many potential purchasers are unlikely to take. Simply instructing consumers in the disclosure statement to "be careful" when using the ATV is unlikely to be effective at reducing the risk of death and injury since consumers very likely do not believe they are using or will use an ATV carelessly, are unlikely to find a general statement about being careful very useful in determining appropriate hazard-avoidance behaviors, and are unlikely to remember any specified avoidance behaviors when they are eventually needed while riding the ATV.

6. Three-wheeled ATV ban. The staff package indicates that there are at least some three-wheeled vehicles ostensibly used as golf carts that would be banned under the proposed three-wheeled ATV ban. Has staff explored whether a safety standard for these vehicles could be developed? Can we meet the requirements of Section 8 with respect to these vehicles?

Response:

Staff does not currently have sufficient information to determine that there is a need for a safety standard for three-wheeled vehicles that are used as golf carts. The staff intends to obtain more information about these products during the comment period (assuming the Commission issues the NPR) and then assess whether an exemption would be necessary/possible for some three-wheeled vehicles that meet the ATV definition but do not pose the same risks as conventional three-wheeled ATVs.

7. Advertising. Does the Commission have the authority to require in the rule that ATV advertising have the same warnings as now provided for in the Letters of Undertaking?

Response:

The Office of General Counsel will send the response to this question under separate cover in a restricted memorandum.