BEFORE THE
UNITED STATES CONSUMER PRODUCT SAFETY COMMISSION

COMMENTS OF
RECREATIONAL OFF-HIGHWAY VEHICLE ASSOCIATION

16 C.F.R. Part 1422:	)	
Safety Standard for Recreational	)	
Off-Highway Vehicles (ROVs)	)	
	)	**Docket No. CPSC-2009-0087**
Notice of Proposed Rulemaking	)	
	)	
79 Fed. Reg. 68963 (Nov. 19, 2014)	)	
	)	

June 19, 2015

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I. INTRODUCTION

These comments are submitted by the Recreational Off-Highway Vehicle Association (ROHVA) in response to the Notice of Proposed Rulemaking (NPR) to establish a safety standard for recreational off-highway vehicles (ROVs) issued by the U.S. Consumer Product Safety Commission (CPSC). The NPR – voted out 3 to 2 – requested comments regarding the proposed requirements. 79 Fed. Reg. at 68964 (Nov. 19, 2014).

ROHVA is a not-for-profit trade association sponsored by Arctic Cat, BRP, Honda, John Deere, Kawasaki, Polaris, and Yamaha. ROHVA was formed to promote the safe and responsible use of ROVs manufactured or distributed in North America. ROVs are well-established in the marketplace and growing in popularity. Between 2011 and 2014, sales figures are conservatively estimated to total more than 750,000 in the United States. That does not include the hundreds of thousands of ROVs sold prior to 2011.

ROHVA is accredited by the American National Standards Institute (ANSI) to develop standards for the equipment, configuration, and performance of ROVs. ROHVA has worked almost seven years with numerous stakeholders, including CPSC, to develop voluntary standards for ROVs, commencing in 2008 and culminating in voluntary standards approved in 2010, 2011, and most recently in September 2014.

The NPR fails to satisfy statutory requirements, misapplies or ignores some data, lacks other essential data, and overstates the conclusions. Review of the incident data and documents underlying the rulemaking – which CPSC produced in March 2015 following ROHVA's successful Freedom of Information Act appeal – reveals that they do not support the hazard analysis underlying the NPR. For example, a significant portion of the incident data is a collection of short, self-serving summaries written by a single personal injury law firm. And when independent experts reviewed these and other data underlying the NPR – including the

vehicle dynamics expert extensively cited and relied upon by CPSC staff – each expert concluded that critical assumptions, analyses, and conclusions in the NPR are wrong, unsupported, or otherwise inadequate to sustain mandatory rules. Because of these errors, the proposed rules could adversely affect ROV handling, performance, and safety. The problems with the NPR are so pervasive that Congress has introduced bi-partisan legislation – the ROV In-Depth Examination Act – requiring review of the data and science underlying the NPR by other expert federal agencies.

At the same time, CPSC has ignored repeated suggestions from members of the U.S. Congress, ROHVA member companies, and ROV enthusiasts to suspend this mandatory rulemaking and to work instead through the voluntary standards process. CPSC data show that the overwhelming majority of these incidents involve riders not using the seatbelts installed in every ROV or not wearing helmets, driving ROVs on streets as if they were cars, allowing children under 16 years of age to drive, or engaging in other dangerous and clearly warned against behaviors like drinking and driving. No one has demonstrated that the standards in the NPR will achieve the claimed safety benefits, a point conceded during the staff briefing.

CPSC staff and ROHVA member companies have ongoing discussions regarding potentially mutually agreeable revisions to the voluntary standards. Those talks have been productive, and it would be a mistake for the talks to end now. CPSC Commissioners and staff repeatedly have stated that critique of the NPR will not hinder those efforts. In that regard – working through the voluntary standards process in order to reach consensus requirements for ROVs – both CPSC and ROHVA are in agreement. That path offers a far more effective and efficient process to promote ROV safety, and will avoid the potential unintended adverse consequences that the NPR's mandates would have on ROVs and ROV users.

II. SUMMARY OF ROHVA'S COMMENTS

A. Statutory Requirements

CPSC has failed to provide and specify the facts necessary to make the findings required by Section 9 of the Consumer Product Safety Act, 15 U.S.C. § 2058. CPSC has not shown that the changes it seeks to require in steering, stability, and handling of ROVs will reduce any of the injuries it has identified as associated with ROV operation. Further, as explained in the comments submitted by Dr. John Morrall III and attached hereto as Exhibit 3, CPSC has failed to perform a valid regulatory analysis of the rule meeting the statutory requirements, and CPSC's cost/benefit analysis reveals that the costs of the proposed passenger-side seatbelt speed-limiter significantly exceed the claimed benefits. Finally, CPSC's analysis of the recently promulgated ANSI / ROHVA 1-2014 voluntary standards is inadequate as a matter of law because there is no evidence that CPSC tested the new voluntary standards or newer ROVs, despite significant changes in both the standards and vehicle technology.

B. Hazard Analysis

The NPR is based upon a 2012 hazard analysis by CPSC staff of 428 reports of ROV-related incidents that occurred between 2003 and 2011. Based on that review, CPSC staff concluded that lateral rollover and occupant ejection is a "dominant hazard pattern" for ROVs, resulting in the proposed mandates for dynamic lateral stability and vehicle handling. But when JP Research, Inc. performed a comprehensive review of CPSC-coded "rolled sideways" incidents, they found that only a small fraction (12%) of these incidents involved the lateral rollover scenarios CPSC identifies as being addressed in the NPR. *See* Exhibit 1 attached hereto. Further, when JP Research analyzed more recent incidents from 2012 to 2013, they found that an even smaller fraction (9%) involved the lateral rollover scenarios addressed by the NPR. This analysis found that only 39% of the more recent (2012-2013) incidents were "rolled sideways"

incidents, as compared to 68% for the earlier (2003-2011) incidents, reflecting a substantial change in ROV hazard patterns.

As a result, the NPR is misdirected because the lateral rollover hazard scenarios identified by CPSC that it addresses are actually fairly rare, meaning the proposed mandates are unlikely to reduce the potential injuries CPSC has identified as associated with ROV operation. When the lateral rollovers incidents are examined more closely, they reflect the prevalence of hazard patterns associated with warned against behaviors, such as persons under 16 years of age driving ROVs, consuming alcohol shortly before or while driving an ROV, riding in an ROV without wearing a seatbelt or a helmet, stunt driving, driving on highways, and operating at speeds excessive for the conditions.

C. Handling Requirements (Understeer Mandate)

The NPR relies heavily on Dr. Thomas D. Gillespie's *Fundamentals of Vehicle Dynamics* to argue that any sub-limit oversteer "can lead to untripped ROV rollovers or cause ROVs to slide into limit oversteer and experience tripped rollover." ROHVA asked Dr. Gillespie to review the NPR and provide his own independent views about ROV handling characteristics and CPSC's application of his work. As reflected more fully in his comments to the NPR, Dr. Gillespie is "concerned that the fairly brief and simple explanation of oversteer presented in [his] book is insufficient to provide a sound engineering basis for regulating performance as proposed in the NPR." *See* Exhibit 2 attached hereto. He concluded that "it is far from clear that the design changes that will be required by the regulation will necessarily contribute to a positive influence on ROV design, but may have unintended adverse consequences on vehicle handling, performance, and safety."

Further, CPSC's own data show that ROV handling characteristics on pavement (CPSC's testing surface) do not necessarily reflect that same vehicle's handling characteristics in off-road

surfaces. In testing conducted by SEA for CPSC, the majority of test runs revealed that the understeer or oversteer characteristics exhibited by the vehicle on pavement was found to be the reverse on the dirt surface.

D. Lateral Stability Requirements (J-Turn Test)

CPSC's proposed J-turn test is an unprecedented attempt to use lateral acceleration as a pass/fail criteria for dynamic stability. Although CPSC points to NHTSA's use of the J-turn test, the reality is NHTSA does not use lateral acceleration at two-wheel lift as a pass/fail criterion.

When CPSC's J-turn test is evaluated, it becomes clear that it (a) does not simulate a realistic use case; (b) is not repeatable, as reflected in SEA's testing for CPSC, which excluded numerous test runs where two-wheel lift did not occur and found variations up to 0.027 g – or approximately 4% of the measured value – which is significant because four of the 10 ROVs tested by SEA had lateral acceleration values within 4% of the proposed pass/fail criteria of 0.70 g; (c) is not reproducible and in fact CPSC has presented no J-turn test results from test entities other than SEA at different locations and test facilities; and (d) is overly complicated, inefficient, and expensive.

E. Hang Tag

The proposed hang tag would depict a particular model ROV's minimum lateral acceleration at two-wheel lift on asphalt (J-turn test) on a sliding scale from approximately 0.65 g to 1.0 g, where 0.70 g is "Minimally acceptable" and closer to 1.0 g is "Better." As a matter of law, the hang tag is authorized only if it provides safety-related data that assists consumers in making comparative safety evaluations among ROV models. CPSC, however, expressly acknowledges in the NPR that it "do[es] not have sufficient data to estimate the injury rates of models that already meet the requirements and models that do not meet the requirements." 79 Fed. Reg. at 69004. In other words, there is no data showing that ROVs with

lateral acceleration of 0.70 g and above are safer than ROVs with lateral acceleration below 0.70 g, or that ROVs with a lateral acceleration of 0.80 g are safer than ROVs with 0.75 g, for example.

The proposed hangtag is thus unauthorized for two reasons. First, CPSC has failed to demonstrate through comparative injury rate data that a vehicle's minimum lateral acceleration at two-wheel lift in the J-turn is safety related. Second, rather than assisting consumers in making comparative safety evaluations of ROV models, the hang tag would mislead them into making comparative evaluations based on data that has not been shown to be safety related.

F. Seatbelt Speed-Limiter

Approximately 60% of Model Year 2015 ROVs already include a driver-side seatbelt speed-limiter, and ROV manufacturers have discussed with CPSC staff revising the voluntary standards to require a driver-side seatbelt speed-limiter in ROVs with electronic throttle control and a maximum speed above 30 MPH by Model Year 2018. But there would be significant challenges and risks to implementing a passenger-side seatbelt speed-limiter: consumers are opposed to it as reported in the CPSC-commissioned Westat Phase 2 study; the passenger taking control of the ROV by unbuckling the seatbelt and thereby causing the ROV to lose power in what could be very rugged terrain; the seat must be able to "know" when a passenger is sitting in it (as compared to a toolbox or a dog placed on the seat); when properly analyzed its costs significantly exceed its estimated benefits; and technological challenges making the passenger-seat sensors water- and elements-proof, which is made more difficult because passenger seats are sometimes removed by drivers to make room for cargo and thus expose the sensors, and which then must be put back together again or else the ROV will not exceed 15 MPH.

G. Shoulder Zone Passive Barrier

CPSC previously proposed, and ROHVA adopted in its new voluntary standards, a single-hand, single-operation barrier. Now CPSC has proposed instead a fixed barrier along the ROV's side, which is an alternative option available in the voluntary standards. Rider groups have testified before CPSC in opposition to this proposed requirement, concerned that the narrow opening would hinder some riders and it could be an obstacle to medical personnel helping riders in the event of an accident. If CPSC's principal concern is maintaining a barrier that cannot be easily removed or rolled up, the single-hand, single-operation barrier addresses that concern while also maintaining the alternative option of a fixed barrier.

H. Time To Implement

If CPSC presses ahead with the NPR despite these issues, the surviving requirements will require design changes, testing, and validation, among other steps. The short timeframes proposed in the NPR are inadequate for this process. At a minimum, if a final rule is published prior to June 2016, then implementation should be in Model Year 2018; and if published between June 2016 and June 2017, then implementation should be in Model Year 2019.

I. Next Steps

Congress has introduced bi-partisan legislation requiring that the NPR be examined by other federal agencies, including the National Academy of Sciences, in consultation with the National Highway Traffic Safety Administration and the Department of Defense. Meanwhile, ROHVA has formally opened its voluntary standards for possible revision, and CPSC staff and ROV manufacturers are engaged in ongoing discussions about the voluntary standards. CPSC should suspend the rulemaking and continue to work with ROHVA on consensus voluntary standards, making the pending legislation unnecessary.

III. BACKGROUND RELEVANT TO THE RULEMAKING

A. American National Standards Institute Development Process

In 2008, ROHVA became an organizational member of the American National Standards Institute (ANSI) and was accredited to proceed with the development of voluntary standards for the equipment, configuration and performance requirements of ROVSs. The ANSI administrative procedures for standards development are rigorous, extensive, transparent by nature, and subject to audit. The hallmarks of the ANSI process include:

- consensus[1] must be reached on proposed standards by a group or "consensus body" that includes representatives from materially affected and interested parties;

- draft standards are required to undergo one or more open public reviews during which time any member of the public may submit comments;

- comments submitted by voting members of the relevant consensus body and by public review commenters must be evaluated, responded to and if appropriate, incorporated into the draft standard; and

- anyone believing that due process principles were not sufficiently respected during the standards development process has the right to appeal in accordance with the ANSI-accredited procedures of the standards developer.

ROHVA develops a list of potential canvassees from various interest categories that will be materially and directly affected by the standards. The relevant interest categories include the following:

[1] ANSI defines consensus as: Consensus means substantial agreement has been reached by directly and materially affected interests. This signifies the concurrence of more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that an effort be made toward their resolution.

- **Producer** – A manufacturer or distributor of ROVs. (Companies that sell but do not produce or distribute ROVs are classified in the "General Interest" category.)

- **User/User Association** – An organization (company, association, government agency) or individual that uses ROVs.

- **General Interest** – An individual or organization that has an interest in the use of ROVs but neither produces or uses them directly.

- **Government Agency** – A government agency or department within North America that has an interest in the use of ROVs.

A list of potential canvassees is developed from interested persons forwarded to ROHVA by ANSI, those who have reached out to ROHVA directly expressing interest in participating, or those solicited by ROHVA. These potential canvassees are then mailed a pre-interest survey describing the ANSI development process and the role they would play as a canvassee. A final list is compiled from those responding affirmatively, which, as required by ANSI, must be balanced between interest categories so that no one interest category dominates the process.

The draft standards are then prepared by a Technical Advisory Panel and balloted to the canvass group. Each canvassee casts a vote to "approve", "approve with comment", "object to with reasons", or "abstain from" either on a paper ballot or through ROHVA's electronic ballot website. Any comments that are received as part of the balloting process are responded to in writing by ROHVA, and accepted comments are incorporated into the proposed standards. All comments and responses are posted on ROHVA's website for canvassee review and any outstanding objections are included with a subsequent re-circulation ballot. There may be multiple ballots to the canvass as the proposal is refined.

Once substantial agreement has been achieved by the canvass on a proposal, ROHVA provides notice to ANSI and makes the proposed standards available for public review and comment. All public review comments are responded to in writing and accepted comments are

incorporated into the proposed standards. Any material change to the proposed standards requires re-balloting and additional public review.

There are specific time frames associated with many of these activities. For example, a Pre-Canvass Survey is mailed with a 30-day response time. When proposed standards are canvassed, ROHVA must allow 30 days for a response (or until all ballots are received, if earlier) before taking further action. Additional time must be allotted for the consideration of views, objections, and appeals. The public review period is 45 days after ROHVA makes the request and ANSI publishes notice. The actual time required to complete the final revision depends on multiple factors that include the response times of canvassees, the number of comments and objections, and the number of times the draft standards are canvassed and undergo public review.

When ROHVA has determined consensus is achieved and public review completed, a submission to approve the standards is made to ANSI. If ANSI is satisfied that ROHVA's submission meets ANSI requirements, ANSI approves it and notice is provided to ROHVA and the standards are prepared for publication. Considering all the steps in the process of the mandated time frames, the minimum amount of time from initiation of a revision to ANSI approval is nine months.

B. Communications Regarding The ANSI / ROHVA Voluntary Standard

In August 2013, CPSC staff suggested to ROHVA that the ANSI / ROHVA 1-2011 voluntary standards should be revised. In November 2013, ROHVA responded that it was opening the standards for revision, and requested a meeting with CPSC staff in December 2013 or January 2014 to discuss any changes. CPSC staff never responded to ROHVA's request for a meeting, and instead wrote back in February 2014 that CPSC would participate in the voluntary standards development process.

During the balloting and comment period in the standards development process, CPSC staff provided the following statement: "My participation in the canvass is as a non-voting member. However, a letter with CPSC staff comments to the proposed requirements will follow." Ballots and comments were due on April 12, 2014. ROHVA did not receive comments from CPSC staff, so ROHVA sent a letter reminding CPSC staff that the "procedures provide for a maximum ballot extension of 30 days, if requested. Although the CPSC did not request an extension, ROHVA waited until May 16, 2014 (over 30 days after the close of balloting) to respond to comments." In other words, ROHVA voluntarily granted an extension to CPSC, which pushed the ultimate approval by ANSI back by over a month.

A few days later, CPSC staff acknowledged the oversight and promised to provide comments shortly. Once received, ROHVA's Technical Advisory Panel began reviewing and analyzing all proposed changes. Subsequently, ROHVA sent an 18-page letter to CPSC staff explaining the rationale for the specifications in the then-pending 2014 draft voluntary standards and concerns with CPSC staff's proposals.

The ANSI process then continued to the re-circulation ballot, which closed on August 30, 2014. CPSC staff were included in that re-circulation ballot. The updated draft standards were submitted to ANSI on September 2, which CPSC staff also knew about. At that point, ROHVA's role in the development process was over, and approval or disapproval of the new standards rested entirely with ANSI.

Three weeks later, on September 24, CPSC published the staff's Briefing Package[2] in support of the now-pending NPR. The same day, ANSI – not ROHVA – approved the 2014 voluntary standards. That ANSI approved the updated standards in late September could not

[2] CPSC, *Notice of Proposed Rulemaking (NPR) for Recreational Off-Highway Vehicles* (Sept. 2014) ("Briefing Package").

have been surprising to CPSC staff given their knowledge of the voluntary standards process and timeline, and the fact that the standards had been submitted to ANSI for review and approval weeks earlier.[3]

Fortuitously, ROHVA had previously scheduled meetings with some of the CPSC Commissioners for September 30, one week after the Briefing Package was published. In those meetings, which had added significance in light of CPSC staff's Briefing Package, ROHVA reviewed the new voluntary standards and explained that a principal problem with the rulemaking is it (a) analyzes the old, superseded voluntary standards (ANSI / ROHVA 1-2011) and (b) relies on testing of outdated ROVs from Model Year 2010 conducted primarily on paved surfaces, instead of the off-highway environments where the vehicles are designed for use.

Although it took CPSC staff years to test Model Year 2010 ROVs and analyze the 2011 voluntary standard, they spent just three weeks preparing a Supplemental Information Memorandum dismissing the new voluntary standards as inadequate. The Memorandum does not evidence any testing of the new standards or testing of newer ROVs, despite sigificant changes in both the standards and vehicle technology since 2010.

At CPSC's request, ROHVA member companies sent engineers and other technical staff to meet with CPSC technical staff in Rockville, MD on October 23, 2014. The meeting included substantive discussions regarding CPSC staff's proposed testing, as well as ongoing concerns about repeatability and reproducibility; with respect to steering and handling, potential common ground was identified regarding the desirability of avoiding divergent instability; and there was a

[3] Despite that knowledge, at the October 22, 2014 staff briefing to the Commissioners, ROHVA was wrongly accused of engaging in law firm litigation tactics because the release of the Briefing Package coincided with ANSI's approval of the new voluntary standards at the end of a year-long revision process that CPSC staff helped work on, and had been delayed by CPSC staff's overdue comments.

general recognition of the common use of audible and light alert seatbelt reminders in on-road vehicles and the challenges raised by a seatbelt speed-limiter for passenger seats and for certain types of engines in ROVs. Nonetheless, CPSC ended substantive discussions with ROHVA and voted out the NPR a week later. The NPR was published in the Federal Register on November 19, 2014. Comments were originally due by February 2, 2015.

C. CPSC Staff Briefing Package And Briefing To Commissioners

CPSC staff have advised the Commissioners that they do not know if the requirements in the NPR will actually improve safety. First, they said it in the Briefing Package at page 131:

> Although the Commission believes that the dynamic lateral stability and vehicle handling requirements will reduce the number of deaths and injuries involving ROVs, it is not possible to quantify this benefit because we do not have sufficient data to estimate the injury rates of models that already meet the requirements and models that do not meet the requirements. Thus, we cannot estimate the potential effectiveness of the dynamic lateral stability and vehicle handling requirements in preventing injuries.

And then again during the October 22, 2014 CPSC staff briefing to the Commissioners:

> STAFF: "We don't know how many of those [rollover] incidents would be prevented [by the proposed rules]. That's what we couldn't quantify…."
>
> CMR. ADLER: "Can we not get, not necessarily a precise calculation of the number of rollover incidents reduced, but at least a range of rollover incidents that would be reduced?"
>
> STAFF: "We would have to look at the data, looking at the exposure over time to the different [ROVs]. It might be possible to do something like that. We have not done that." (Video at approximately 51:30 http://www.cpsc.gov/en/Newsroom/Multimedia/?vid=70928.)

D. January 7, 2015 Public Comment Hearing

On January 7, 2015 CPSC held a Public Meeting seeking comments on the NPR. According to CPSC, it was the longest CPSC hearing on record. It commenced at approximately

9:00 a.m. and ended after 6:00 p.m. That is more than twice as long as CPSC staff spent briefing the Commissioners on the proposed rulemaking.

Representatives of industry and rider groups were unanimous in their opposition to the NPR and voiced strong support for working through the voluntary standards process. Some Commissioners spent substantial time critiquing those positions, including cross-examination style "yes or no" questions directed at industry. Industry and enthusiasts provided extensive information regarding ROVs and how they are used in the real world.

One of the principal issues raised during the Public Meeting was whether ROHVA would agree to open the voluntary standards for discussion and possible revision. As noted below in Section XVI, ROHVA has opened the voluntary standards for potential revision, provided formal notice to ANSI, and notified CPSC of that action.

E. CPSC's Belated Production Of Documents And Data Underlying the NPR

In December 2013, ROHVA requested copies of the 428 incident reports and the analyses and tabulations from CPSC staff multidisciplinary review. In response, CPSC staff advised that the analyses and tabulations would be made public in the then-upcoming NPR Briefing Package, and further advised that the request for the incident reports had been forwarded to the CPSC Office of the Secretary.

Approximately eight months later, in August and September 2014, ROHVA received certain records described by CPSC as:

> Freedom of Information Act (FOIA) Request #14-F-00303; Request the task numbers and copies of (IDI) reports and copies of which ROHVA has previously obtained. This request covers any additional IDI's not on the attached list that are encompassed by the ROV Incident Summary.

The transmittal letters did not identify specifically what was being transmitted; nor did they indicate whether all of the reports were provided. In fact, the documents were essentially

unusable, being in no evident order or categorization. Further, there was no distinction made between the 428 ROV-related incidents included in the staff's multidisciplinary review and hazard analysis, and 122 other incidents noted but not analyzed in the NPR.

It would be impossible to comment meaningfully on the NPR without access to the same underlying data on which it is based. Accordingly, ROHVA requested properly identified and sorted electronic copies of the 428 incidents that are included in the CPSC staff multidisciplinary review, as well as the 122 additional more recent incidents. Following numerous discussions and email exchanges, CPSC staff agreed to provide ROHVA with (a) a table of 550 incident reports with markers of which reports were used in the incident analysis referenced in the NPR, (b) PDFs of all 550 reports in the same order as the table, and (c) the data files in Excel file format. At industry's request, CPSC extended the comment period to April 8, 2015.

Unfortunately, CPSC staff scanned the reports in batches, and each PDF contained hundreds of pages. When the PDFs were disassembled, the reports were incomplete or missing. And the data files were so heavily redacted that even the column headings were deleted.

Given the central role that data must play in any rulemaking, ROHVA was forced to file an appeal under the Freedom of Information Act. A month later, CPSC's General Counsel agreed that CPSC should have produced all of the documents and data without redactions to ROHVA months earlier. At industry's request, CPSC extended the comment period to June 19, 2015.

In March 2015, CPSC began its new production. Given ROHVA's numerous requests, successful FOIA appeal, and the looming comments deadline, ROHVA necessarily must treat CPSC's recent production of documents and data as final and complete for purposes of the rulemaking.

IV. RULEMAKING STATUTORY REQUIREMENTS

Section 7 of the Consumer Product Safety Act ("CPSA") permits CPSC to promulgate consumer product safety standards which include two types of requirements: (1) performance requirements; and/or (2) requirements that the product be marked with or accompanied by clear and adequate warnings or instructions, or requirements respecting the form of warnings or instructions. 15 U.S.C. § 2056(a). Any such requirement must be "reasonably necessary to prevent or reduce an unreasonable risk of injury associated" with the product. *Id.*

The statutory requirements – both substantive and procedural – governing rulemakings conducted by CPSC to establish consumer product safety standards pursuant to Section 7 are set out in Section 9 of the CPSA, 15 U.S.C. § 2058.

Pursuant to Section 9(f), prior to promulgating a consumer product safety rule, CPSC must consider and make findings with respect to:

> (A) the degree and nature of the risk of injury the rule is designed to eliminate or reduce;
>
> (B) the approximate number of consumer products, or types or classes thereof, subject to such rule;
>
> (C) the need of the public for the consumer products subject to such rule, and the probable effect of such rule upon the utility, cost, or availability of such products to meet such need; and
>
> (D) any means of achieving the objective of the order while minimizing adverse effects on competition or disruption or dislocation of manufacturing and other commercial practices consistent with the public health and safety.

In this proceeding, CPSC has failed to provide and specify the facts necessary to make the findings required by Section 9(f). In particular, CPSC has failed to specify the facts

supporting any specific findings about the degree and nature of the risk of injury that the rule is designed to eliminate or reduce as it relates to the countermeasures that the rule seeks to impose relative to changes in steering, stability, and handling of ROVs. In plain English, CPSC has not shown that the changes it seeks to require in steering, stability, and handling of ROVs will reduce any of the injuries it has identified as associated with ROV operation. CPSC thus cannot meet its statutory burden to justify the proposals related to steering, stability, and handling of ROVs.

In addition, Section 9(f)(2) specifies that "the Commission shall not promulgate a consumer product safety rule unless it has prepared, on the basis of the findings of the Commission under paragraph (1) and on other information before the Commission, a final regulatory analysis of the rule" that contains the following information:

> (A) A description of the potential benefits and potential costs of the rule, including costs and benefits that cannot be quantified in monetary terms, and the identification of those likely to receive the benefits and bear the costs.
>
> (B) A description of any alternatives to the final rule which were considered by the Commission, together with a summary description of their potential benefits and costs and a brief explanation of the reasons why these alternatives were not chosen.
>
> (C) A summary of any significant issues raised by the comments submitted during the public comment period in response to the preliminary regulatory analysis, and a summary of the assessment by the Commission of such issues.

ROHVA's consultant, Dr. John Morrall, has explained in his separate comments why these statutory requirements have not been satisfied, and ROHVA endorses Dr. Morrall's conclusions. *See* Exhibit 3 (John F. Morrall III, *Review of Consumer Product Safety*

Commission Preliminary Regulatory Impact Analysis for its November 19, 2014 Proposed Mandatory Rule on Recreational Off-Highway Vehicles ("Morrall Report").

Furthermore, pursuant to Section 9(f)(3), CPSC shall not promulgate a consumer product safety rule unless it finds:

> (A) that the rule (including its effective date) is reasonably necessary to eliminate or reduce an unreasonable risk of injury associated with such product; [and]
>
> (B) that the promulgation of the rule is in the public interest . . . .

As noted above, the "unreasonable risk of injury" identified by CPSC has not been correlated with the proposed countermeasures, especially as related to the proposed changes to vehicle steering, stability, and handling.

Moreover, pursuant to Section 9(f)(3)(D), if a voluntary consumer product safety standard on this issue has been adopted and implemented at the time the final rule is promulgated, if CPSC elects not to rely on the voluntary standard, it must find that:

> (i) compliance with such voluntary consumer product safety standard is not likely to result in the elimination or adequate reduction of such risk of injury; or
>
> (ii) it is unlikely that there will be substantial compliance with such voluntary consumer product safety standard.

Here, voluntary standards have been adopted. CPSC's analysis of those standards does not meet the statutory requirements for finding that compliance with them will not result in the elimination or adequate reduction of risk of injury. ROHVA submits that CPSC analysis of the existing standards is inadequate under the statute.

CPSC must also find "that the benefits expected from the rule bear a reasonable relationship to its costs" [Section 9(f)(3)(E)]; and "that the rule imposes the least burdensome

requirement which prevents or adequately reduces the risk of injury for which the rule is being promulgated" [Section 9(f)(3)(F)]. As discussed above, ROHVA submits that the analysis performed for the proposed rule does not meet this statutory requirement. The comments of Dr. John Morrall expand on this deficiency, and ROHVA endorses his comments.

Finally, pursuant to Section 11(c) of the CPSA, 15 U.S.C. § 2060(c), all of the findings required under Section 9(f)(1) and (3) must be supported by "substantial evidence on the record taken as a whole." This requirement is more stringent than the normal "arbitrary and capricious" standard of review for notice and comment rulemaking under the Administrative Procedure Act. 5 U.S.C. §§ 553, 706(2)(A). *Gulf South Insulation v. CPSC*, 701 F.2d 1137, 1142 (5th Cir. 1983). In determining whether a final rule is supported by substantial evidence, facts in the record that detract from the agency as well as those that support it are to be considered. *Id.* at 1142-43. In particular, a determination that a risk of injury is unreasonable must include a quantification of how likely the injury is to occur under the risk scenario that the rule purports to address. *Id.* at 1148. Correspondingly, there must be substantial evidence in the record to demonstrate that the rule is reasonably necessary to (and by clear implication will) eliminate or reduce the unreasonable risk associated with the product.

V. INCIDENT DATA AND HAZARD ANALYSIS

The NPR is based upon a 2012 hazard analysis by CPSC staff of 428 reports of ROV-related incidents that occurred between January 1, 2003 and December 31, 2011. *See* Analysis of Reported Incidents Involving Deaths or Injuries Associated with Recreational Off-Highway Vehicles (ROVs) (May 2012) ("2012 Hazard Analysis"). The NPR acknowledges that CPSC also received an additional 122 reports of ROV-related incidents that occurred between January 1, 2012 and April 5, 2013, but no comparable hazard analysis has been conducted of these more recent injury reports. The Briefing Package states that CPSC staff conducted a

preliminary review of these more recent incidents, and did not detect a change in the hazard patterns identified in its 2012 Hazard Analysis. Briefing Package at 12.

A. NPR Hazard Analysis

In the 2012 Hazard Analysis, CPSC staff determined that 68 percent of the 428 reported ROV-related incidents which occurred during 2003-2011 involved lateral rollover of the vehicle (coded as "rolled sideways"), and that more than half of those rollovers occurred while the vehicle was making a turn. 79 Fed. Reg. at 68965. CPSC staff analysis indicated that of the 224 fatal incidents in this data set, 66 percent involved rollover of the vehicle and half of those occurred on flat terrain. *Id.* In addition, CPSC staff determined that 89 percent of severely injured victims were involved in incidents with lateral rollover of the ROV. *Id.*

CPSC staff analysis also found that with respect to fatally and non-fatally injured victims for whom seatbelt use was known, 75 percent were not wearing a seatbelt. *Id.* at 68966. Their analysis further determined that 86 percent of the fatally injured victims were ejected from the vehicle, and that with respect to those ejected victims for whom seatbelt use was known, 91 percent were not wearing a seatbelt. *Id.*

Based on the 2012 Hazard Analysis, CPSC staff concluded that ROV rollover and occupant ejection is a "dominant hazard pattern." Briefing Package at 2. CPSC staff expressed the belief that increasing the lateral rollover resistance and imposing a vehicle handling requirement for understeer will reduce the occurrence of ROV rollovers, and that requiring a seatbelt speed limiting interlock will reduce deaths and injuries associated with occupants who are ejected during rollover events. *Id.* at 3.

B. The Proposed Dynamic Lateral Stability And Vehicle Handling Requirements Are Intended To Address Specific Lateral Rollover Scenarios

The NPR advances two proposed requirements to address the "dominant hazard pattern" of ROV rollover. In particular, CPSC expressed the belief that "lateral stability and vehicle handling have the most effect on rollovers during a turn on level terrain because the rollover is caused primarily by lateral acceleration generated by friction during the turn." 79 Fed. Reg. at 68967.

1. Dynamic Lateral Stability

The NPR includes a dynamic lateral stability requirement in the form of a J-turn test conducted on a flat paved surface with a minimum lateral acceleration at two-wheel lift pass/fail criteria of 0.70 g. CPSC stated that "vehicles with low rollover resistance exhibit untripped rollover on pavement during a J-turn test, and the lateral acceleration can be measured." *Id.* at 68970. CPSC further explained that the proposed dynamic lateral stability requirement "is intended to ensure that all ROVs on the market have at least a minimum level of resistance to rollover during turns," as determined by this J-turn test on a level surface. *Id.* at 69004.

2. Vehicle Handling

CPSC's vehicle handling proposal is based on constant radius testing, again on a flat paved surface. The NPR suggests that this requirement would eliminate a vehicle characteristic (*i.e.*, oversteer) that can cause a sudden increase in lateral acceleration leading to rollover during a turn on level ground. *Id.* at 68975. CPSC further explained "the proposed understeer requirement is intended to reduce the likelihood of a driver losing control of an ROV during a turn, which can lead to vehicle rollover, striking another vehicle, or striking a fixed object." *Id.* at 69004.

C. Analysis Of ROV incidents Coded As "Rolled Sideways" Indicates Very Few Involved Rollover Scenarios The NPR Requirements Are Intended To Address

JP Research, Inc. ("JP Research") performed a comprehensive manual review of all 289 ROV incidents that occurred between January 1, 2003 and December 31, 2011 and were coded by CPSC as "rolled sideways," as well as 47 incidents from 2012-2013 that JP Research coded as "rolled sideways" after conducting an evaluation using CPSC's coding variables and instructions. *See* Exhibit 1 ("JP Research Report"). This review included assessing all available information regarding each individual "rolled sideways" incident. The purpose of the review was to determine the extent to which each incident involved the specific lateral rollover hazard scenarios the proposed dynamic lateral stability and vehicle handling requirements are intended to address in order evaluate the NPR's hypothesis that the requirements would acceptably reduce rollovers because these are the dominant hazard patterns.

1. Methodology

Based upon its review of all the information made available by CPSC, JP Research categorized each of the 289 incidents coded by CPSC as "rolled sideways," as well as each of the 47 incidents from 2012-2013 which it coded as "rolled sideways" based on CPSC's variables and instructions, into one of the following classifications:

- No (N): Any scenario where the NPR proposed requirements (sub-limit understeer and/or a minimum lateral acceleration of 0.70 g at two-wheel lift in the J-turn) would not have had an effect on the rollover incident. All non-rollover incidents and end-over-end rollover events are coded as "No." The "No" category includes incidents with no mention of loss of control, incidents involving vehicle impacts with an object or other vehicle prior to rollover, and incidents involving steep slopes or drops (*e.g.*,

falls into ditches, embankments, falls off boulders or ledges, rolling down sand dunes).

- Example: "The victim was traveling on a trail that was not suitable for the large ATV[4] . . . The Trail was wet and sloping . . . The victim backed off the trail rolling the ATV multiple times . . . The length of the slope was estimated 185 feet down at 60 degree angle."

- Example: Vehicle #2 collided with the left front of Vehicle #1 causing Vehicle #1 to eject both its unseatbelted occupants onto the roadway before overturning onto its left side."

- Possible (P): Any incident which falls within the identified rollover scenarios that the NPR is aimed at addressing and which therefore could theoretically be mitigated by its proposed requirements. This would include terms on level ground with paved or hard surface and vehicle speed less than 30 MPH.

  - Example: "Traveling at a steady speed he estimated about 10 - 15 mph and was not accelerating or decelerating when the tipping began . . . incident occurred on a level dirt lot."

- Insufficient Information (I): Not enough information to make a determination on rollover scenario. Typically, no mention of turning or events prior to incidents.

  - Example: "Injured by tip-over."

[4] Although described as an "ATV," the make and model information indicate that this vehicle was in fact an ROV.

- Unknown (U): Incident involves a turning event but information on terrain surface, slope or vehicle speed is unknown.

  - Example: "During the process of turning the wheel, the wheels on the passenger side dug deep into the ground."

2. Results

The JP Research analysis of the 289 ROV incidents from 2003 - 2011 coded by CPSC as "rolled sideways" shows that only a small fraction (12 percent) of these incidents involved the rollover scenarios CPSC identifies as being addressed by the NPR, and that there was not enough information to make such a determination from most (65 percent) of the incidents.

Only a similarly small fraction (12 percent) of the 224 fatal rolled sideways incidents involved rollover scenarios identified as being addressed by the NPR. About half of these fatal incidents (41 percent) involved rollover scenarios different from those identified as being addressed in the NPR. There was not enough information to make such a determination for the rest of the fatal rolled sideways incidents.

The JP Research analysis of the 47 ROV incidents from 2012-2013 which it coded as "rolled sideways" using CPSC's variables and instructions shows that only an even smaller fraction (9 percent) of these more recent incidents involved the lateral rollover scenarios addressed by the NPR.

3. Conclusions

The JP Research analysis shows that very few of the "rolled sideways" ROV incidents involved the lateral rollover scenarios at which the NPR's dynamic lateral stability and vehicle handling requirements are aimed. Based on it analysis, JP Research concluded that it was not possible to estimate the potential effectiveness of those requirements. It went on to note that the

presence of other behavioral factors in these incidents, as discussed below, suggest the proposed requirements would not have any significant real-world impact.

At the very least, the NPR requirements seem unnecessary because the lateral rollover hazard scenarios they are intended to prevent are, in fact, fairly rare occurrences. This in turn suggests strongly that, even assuming their efficacy in those scenarios, the proposed requirements are unlikely to have a substantial impact in reducing any of the potential injuries CPSC has identified as associated with ROV operation, which largely involve more complex hazard patterns, including operator and occupant behavior, that the NPR does not fully recognize. This is another clear indication that CPSC has failed to provide substantial evidence that the NPR dynamic lateral stability and vehicle handling requirements will reduce any of the potential injuries CPSC has identified as associated with ROV operation.

4. Examination Of IDIs Specifically Cited By CPSC

In its October 17, 2014 Supplemental Information Memorandum, CPSC staff criticized the ANSI/ROHVA standard J-turn on the grounds that "110 degrees is not a large steering input, especially in comparison to a U-turn maneuver that is a common method of reversing vehicle direction." Supplemental Information Memorandum at 10. The Memorandum goes on to state "[s]taff is aware of several incidents in which the ROV rolled over while the operator was making a U-turn on level ground . . ." *Id.*

Examination of the three IDIs to which CPSC staff pointed provides clear illustrations of precisely what the JP Research analysis found: categorization of the incident as a lateral rollover while making a turn on level ground is overly simplistic and fundamentally misleading. It implicitly conveys the picture of a normal turning maneuver on a level and uniform surface where the only forces operating on the vehicle are the surface friction on the tires and the

vehicle's lateral acceleration in the turn, and the determinative factor with respect to rollover is the vehicle's lateral acceleration value at two wheel lift.

Objective examination of the three IDIs cited by CPSC staff reveals a wholly different picture:

- **IDI 101201HCC3228**

This incident occurred during a family reunion and Thanksgiving celebration. Three family members, all of whom had been drinking, were traveling on a straight and level paved roadway when the driver's hat blew off and landed on the road. The driver turned off the road onto a gravel driveway and accelerated his speed in the process of going back to get his hat. The vehicle failed to get traction in the gravel causing the wheels to spin. As the vehicle returned onto the paved roadway, the wheels abruptly caught on the higher friction surface, causing the vehicle to lurch and roll onto its right side. None of the occupants was wearing helmets or seatbelts. An occupant sitting in a rear seat was ejected onto the roadway, hit his head on the asphalt, and died.

Although the vehicle was operating on a level paved surface when the turning maneuver began, it left that surface and went onto gravel with a much lower friction coefficient which caused the wheels to begin spinning as the operator accelerated into the turn. The rollover actually began when the vehicle returned from the gravel with its wheels spinning onto the higher friction paved roadway, at which point the wheels grabbed and caused the still turning vehicle to rollover. This is simply not an example of the "rolled sideways while making a turn on level ground" scenario that is advanced as the asserted dominant hazard pattern in the NPR. Moreover, this incident involved alcohol use by the driver.

- **IDI 130104HCC3274**

At 11:30 p.m. after several hours of drinking at a bar, two men took an ROV with a key left in the ignition that was parked outside and drove to an area with municipal baseball fields. As he drove at a "high rate of speed" the operator attempted to make a U-turn and the vehicle overturned. Neither occupant was wearing a seatbelt. The driver was ejected and fatally injured. The toxicology report listed the driver's blood ethanol level at 0.17 gm/100ml.

First, the driver's blood alcohol level of nearly twice the legal limit. In addition, the fact that the rollover occurred while he was trying to make the U-turn at a "high rate of speed" strongly suggests that this incident did not reflect CPSC's implicit scenario of a more normal turning maneuver. Finally, whether or not the vehicle's lateral acceleration value at two-wheel lift was above or below 0.7 g seems to have had no impact.

- **IDI 091130CBB3125**

This incident involved an ROV that had been modified to add passenger seats in the rear cargo bed and an extended roll cage around that area, thereby significantly increasing the height of the vehicle's center of gravity and moving it rearward. There was no police report or EMS log for the incident, nor were there any witness statements. The operator alleged that he was making a U-turn in a circular clearing at the end of a trail on smooth soil at a speed of 3-4 MPH. He then reportedly applied foot pressure to the throttle pedal at the apex of the turn "attempting to accelerate out of the turn," at which point the vehicle overturned crushing his left hand against the roll cage. The victim brought suit against the manufacturer of the ROV.

As an initial matter, in the absence of a police report, EMS log, or any witness statements, there are unavoidable concerns regarding the credibility of self-reported facts by an injured operator who sued the manufacturer. Further, the scenario of pressing the accelerator at

the apex of a tight turn requiring a speed of 3-4 MPH leading to an abrupt vehicle reaction and rollover is once again vastly different from CPSC's asserted dominant hazard pattern of lateral rollover during normal turning on level ground.

D. The Incident Data Reflect The Prevalence Of Hazard Patterns Associated With Warned Against Behaviors

All ROVs bear a prominently displayed permanent general warning label warning against a number of behaviors that have been associated with ROV accidents and injuries. Among these behaviors are persons under 16 years of age driving ROVs, consuming alcohol shortly before or while driving an ROV, riding in an ROV without wearing a seatbelt, riding in an ROV without wearing a helmet, stunt driving, driving on highways, and operating at a speed excessive for the conditions.

A review of the incident data, as well as CPSC staff analysis of the 428 reported ROV incidents between 2003 and 2011 shows that substantial percentages of the incidents involve riders and occupants engaging in these various behaviors:

- 18 percent of the incidents involved drivers under 16 years of age;
- 24 percent of fatal incidents involved drives under 16;
- Of all adult drivers, 38 percent had consumed alcohol, and 39 percent had unknown alcohol status;
- Of adult drivers involved in fatalities, 46 percent had consumed alcohol and 26 percent had unknown alcohol status;
- Of occupants injured or killed whose seatbelt status was known, 75 percent were unbelted;
- Of fatally injured occupants who were ejected from the vehicle and whose seatbelt was status was known, 91 percent were not belted; and

- Of fatally injured occupants whose helmet status was known, only two percent were wearing helmets.

CPSC staff analysis did not report the number of instances or percentages of other important operator-related hazard factors such as stunt driving, operation at excessively high speed, or operating on highways.

Warned against behaviors occurred in the 18 fatal rolled sideways incidents that may have involved the kind of rollover scenarios that CPSC identifies in the NPR as being addressed by the proposed dynamic lateral stability and vehicle handling requirements. Five involved an unbelted underage driver (under 12 years old even though ROV drivers must be at least 16 years old and possess valid drivers' licenses) with no helmet, five involved alcohol use by the driver, four involved erratic driving (intentional swerving, stood up in the seat, etc.), and four involved all occupants being unbelted with no helmet.

Of the six severe injury rolled sideways incidents that may have involved the kind of rollover scenarios CPSC identifies as being addressed in the NPR, two involved all occupants being unbelted with no helmets and one involved swerving to avoid an object in the road. The remaining three incidents do not have sufficient information to know whether warned against behaviors may have been a factor in the accident and injury.

E. Analysis Of The Incident Data Indicates That Riding Without Wearing A Seatbelt Is A Predominant Hazard Scenario For ROV-Related Fatalities And Injuries

Based upon its analysis of the 428 ROV incident reports from 2003 - 2011, CPSC indicated in the NPR that where seatbelt status was known, 75 percent of riders injured or killed in ROV incidents were not wearing their seatbelts. 79 Fed. Reg. at 68966. Further, CPSC indicated that its analysis found that 86 percent of fatally injured victims were ejected from the

ROV, and that where seatbelt use was known for these ejected victims, 91 percent were not wearing a seatbelt. *Id.*

These data indicate that riding unbelted is a predominant hazard scenario for ROV-related fatalities and injuries. In addition to reducing other warned against behaviors, increasing seatbelt use thus appears to represent a most effective approach for reducing such fatalities and injuries.

ROHVA recently submitted a PINS notice to ANSI indicating that it is reopening the ANSI/ROHVA 1-2014 voluntary standards for potential revision. One such potential revision that the ROHVA member companies have discussed with CPSC engineering staff is the addition of a requirement for a driver-side seatbelt speed-limiter which would limit the speed of the vehicle to no more than 15 miles per hour when the driver's seatbelt is not engaged.

F. Analysis Of The 122 ROV Incidents From 2012 - 2013 Shows There Has Been A Substantial Change In The Hazard Patterns Identified In The NPR

CPSC also collected data on 122 ROV incidents that occurred in 2012-2013. A comparison of these data to the 2012 Hazard Analysis is not presented in the NPR, even though CPSC had this newer data while the NPR was being prepared. Nonetheless, the Briefing Package states "[s]taff conducted a preliminary review of the additional reported incidents and did not detect a change in the hazard patterns identified." Briefing Package at 12. However, in-depth evaluation and coding of this more recent incident data by JP Research shows that the conclusions regarding the dominant hazard pattern based on incident data from 4 to 12 years ago (which already are questionable for the reasons demonstrated above) do not hold true for the more recent incidents.

In particular, only 39% of the more recent 122 ROV incidents were coded as "rolled sideways" as compared to the 68% reported for the earlier 428 incidents. *See* Exhibit 1 (Figure 1

vs. Figure 7). This represents a 43% decline in the percentage of ROV incidents coded as "rolled sideways" in the incident data from 2012-2013 as compared to the data from 2003-2011.

In addition, while CPSC reported that more than half of the 2003-2011 lateral rollovers occurred while making a turn, JP Research's evaluation shows that less than half of the more recent 2012-2013 lateral rollovers occurred during a turn. *See* Exhibit 1 (Appendix C spreadsheet shows JP Research's coding of 22 of the more recent 47 lateral rollovers as occurring while making a turn).

Contrary to CPSC staff's conclusion based upon its "preliminary review" of the more recent incident data, this represents a substantial change in ROV hazard patterns between the two time periods. Indeed, the NPR is focused on specific lateral rollover scenarios that now appear to represent a clear minority of ROV incidents. Here again, CPSC has failed to provide substantial evidence that the NPR dynamic lateral stability and vehicle handling requirements will reduce any of the potential injuries CPSC has identified as associated with ROV operation.

G. A Final Rule Cannot Be Based On Outdated And Now Inaccurate Hazard Analysis; CPSC Must Conduct An Updated Analysis Of More Recent ROV Incidents To Determine Current Hazard Patterns

Accepting for purposes of argument that the 2012 Hazard Analysis accurately depicted ROV hazard patterns during 2003-2011, the JP Research evaluation of the 2012-2013 incident data shows that this depiction – upon which the NPR's requirements are based – is no longer accurate. This clearly indicates that CPSC staff's "preliminary review" of the more recent incident data will not suffice for issuance of a final rule that adopts the NPR requirements. CPSC must instead conduct a new hazard analysis of more recently reported ROV incidents occurring from January 1, 2012 through December 31, 2014 in order to determine the current hazard patterns involved in ROV incidents and injuries. The reality is that the NPR is based on

incident data that is now from 4 to 12 years old. There has been tremendous evolution in the design, performance, and occupant protection features of ROVs since 2003. There has also been substantial growth in the experience of ROV users. In these circumstances, it would be arbitrary to proceed to issue a final rule based on outdated incident data and hazard analysis amid clear indications that both ROV hazard patterns and ROVs themselves have changed substantially since that data were collected.

VI. THE VEHICLE HANDLING REQUIREMENTS IN THE NPR ARE BASED ON UNSOUND, UNPROVEN THEORIES AND COULD ADVERSELY AFFECT ROV HANDLING, PERFORMANCE, AND SAFETY

The vehicle handling requirements in the NPR would require that all ROVs exhibit a minimum degree of understeer when driven at slowly increasing speed ("SIS") in a circle on pavement. The new requirements would prohibit any ROV that exhibits neutral or oversteer characteristics when driven in this way on a paved surface.[5]

A. The NPR Relies Heavily On Dr. Thomas D. Gillespie's *Fundamentals Of Vehicle Dynamics* For On-Road Vehicles In Mandating These New Design And Handling Requirements For ROVs

In proposing these vehicle handling requirements for ROVs, the NPR relies heavily on principles from *Fundamentals of Vehicle Dynamics* (1992), authored by Thomas D. Gillespie. The NPR contains numerous citations to Dr. Gillespie's work.[6] CPSC staff also cited extensively to *Fundamentals of Vehicle Dynamics* both in the Briefing Package and during staff's presentation of the NPR to the Commissioners on October 22, 2014.[7]

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[5] The NPR would preclude any ROV that transitions to oversteer below 0.5 g, as measured by a form of constant radius test on a circle of 100-foot radius on pavement.

[6] 79 Fed. Reg. at 68963, 68973-74, 68983, 68984, 68988-89 (citing *Fundamentals of Vehicle Dynamics*).

[7] *See* Briefing Package at 20, 28, 55, 65, 67, 74, 116 (Sept. 2014); *CPSC Meeting: Briefing Matter – Safety Standard for Recreational Off-Highway Vehicles* (Oct. 22, 2014),

Specifically, in reliance upon *Fundamentals of Vehicle Dynamics*, CPSC staff asserts that:

> Vehicles that exhibit sub-limit oversteer have a unique and undesirable characteristic, marked by a sudden increase in lateral acceleration during a turn. This dynamic instability is called critical speed and is described by Thomas D. Gillespie in the *Fundamentals of Vehicle Dynamics* as the speed "above which the vehicle will be unstable." Gillespie further explains that an oversteer vehicle "becomes directionally unstable at and above the critical speed" because the lateral acceleration gain approaches infinity."

79 Fed. Reg. at 68988-89 (citations omitted).

Based on their interpretation of Dr. Gillespie's work, CPSC staff theorizes that any sub-limit oversteer "is undesirable because it can cause a vehicle with high lateral stability (such as a passenger car) to spin out of control, or it can cause a vehicle with low lateral stability (such as an ROV) to roll over suddenly." *Id.* at 68973-74. For ROVs, in particular, CPSC staff "believes this condition can lead to untripped ROV rollovers or cause ROVs to slide into limit oversteer and experience tripped rollover." *Id.* at 68984-85; *see also id.* at 68967, 68975, 68989, 68990, 69004. CPSC staff asserts that "ROVs that understeer in sub-limit conditions do not exhibit a sudden increase in lateral acceleration." *Id.* at 68984-85; *see also id.* at 68989, 69004.

In further support of this theory, CPSC staff refers to limited circle testing of a handful of different ROV models on pavement, which was conducted by its contractor, SEA Ltd. CPSC staff states that, during such testing, an "undesirable" sudden increase in lateral acceleration was "found only in vehicles that exhibit sub-limit oversteer." *Id.* at 68973-74. In contrast, another vehicle "never reached a point where the lateral acceleration increases exponentially because the condition does not develop in understeering vehicles." *Id.* at 68974. This characteristic, in

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http://www.cpsc.gov/en/Newsroom/Multimedia/?vid=70928 (including discussion and even display of *Fundamentals of Vehicle Dynamics* textbook (*e.g.*, at 1:00:02 – 1:00:16)).

CPSC staff's opinion, gives drivers in understeering ROVs "more margin (in time and distance) to correct the steering to prevent rollover than a driver in [an oversteering ROV]." *Id.* CPSC staff also contend that "ROVs can be designed to understeer with minimal cost and without diminishing the utility or recreational value of this class of vehicle." *Id.* at 68989.

B. Dr. Gillespie Strongly Urges CPSC To Reconsider Its Use Of His Work With On-Road Vehicles To Mandate Vehicle Design And Performance Requirements For ROVs

Given CPSC staff's extensive reliance on *Fundamentals of Vehicle Dynamics*, ROHVA asked Dr. Gillespie to review the NPR and to provide his own independent views about ROV handling characteristics, as well as the staff's conclusions about the vehicles in reference to his prior work. Based on his 50 years of professional expertise in vehicle dynamics, first-hand operation of ROVs, and review of the vehicle handling requirements in the NPR, Dr. Gillespie is "**concerned that the fairly brief and simple explanation of oversteer presented in [his] book is insufficient to provide a sound engineering basis for regulating performance as proposed in the NPR**." *See* Exhibit 2 (Dr. Thomas D. Gillespie, *Comments on CPSC NPR for ROVs* at 8 (June 8, 2015) ("Gillespie Report") (emphasis added). Dr. Gillespie has concluded that "it is far from clear that the design changes that will be required by the regulation will necessarily contribute to a positive influence on ROV design, but may have *unintended adverse consequences on vehicle handling, performance, and safety*." *Id.* (emphasis in original).

In his accompanying report, Dr. Gillespie more fully explains that:

> As a result of experiencing four very different vehicles on a wide range of terrain and making a number of detailed enquiries, it is clear to me that the fundamental dynamics of these vehicles gives them good off-road mobility, which is a key attribute. It is also clear that there are significant differences in the dynamics of off-road versus on-road vehicles, as well as differences in the driving techniques required to operate in such dissimilar environments.

Id. at 2.

Dr. Gillespie further observes that "[t]he dynamics of driving cars on paved, public highways is distinctively different than that of driving recreational vehicles off-road. It is not only the differences between paved and unpaved roads with distinctly different friction properties, but also the driving style in each environment." *Id.*

After cautioning that his book, *Fundamentals of Vehicle Dynamics*, "was written for the audience of engineers designing modern day passenger cars and trucks that are used by casual drivers on the public road system, not off-road," Dr. Gillespie goes on to emphasize:

> [T]he intended use and functionality expected from ROVs is distinctively different from the on-road behavior of passenger cars. Hence, reliance on my work with on-road vehicle dynamics as a basis for CPSC to establish ROV off-road handling and stability requirements in the NPR warrants *a careful review and reconsideration* due to [several] significant issues . . . .[8]

Id. at 3 (emphasis added).

Among other things, Dr. Gillespie states that "it is incorrect to assume that every vehicle with oversteer is capable of even reaching critical speed (that speed at which the vehicle would be dynamically unstable). Put simply, oversteer is not synonymous with dynamic instability." *Id.* at 3-4. After explaining these principles in greater detail in his report, Dr. Gillespie emphasizes that:

> The point to be made is that **oversteer vehicles can be driven safely as long as they are below critical speed** because they have a finite lateral acceleration rate gain – which is to say they simply adjust to a new, slightly tighter turn radius. When the driver is providing closed-loop steering feedback to maintain the vehicle on the intended path, the transition to oversteer is marked not by some immediate and critical correction but by a slight relaxation in steering input to maintain the desired line over the ground. Indeed the onset of the oversteer condition is so subtle that it requires careful experimentation to discern it because it is not obvious to the driver. * * * **The appropriate engineering**

[8] The study required by the RIDE Act, which is pending in the U.S. Senate and House of Representatives, would provide that careful review and reconsideration.

> **inquiry, therefore, is whether the vehicle is capable of reaching critical speed (i.e., displaying instability) within the intended or foreseeable use of the vehicle.**

Id. at 5 (emphasis in original).

For ROVs, in particular, Dr. Gillespie observes that "a substantial part of the functional utility provided by [the vehicles] is off-road mobility." As he explains:

> The most obvious difference with ROVs operating in an off-road environment is the continuous maneuvering and steering of the vehicle required to follow paths and trails. This means the ROV rarely if ever really experiences a "steady state" cornering condition – nor even the straight line steady state condition. Therefore regulating their performance characteristics by steady-state behavior on pavements *is unaligned with these vehicles' most common operating condition and of highly questionable validity*.

Id. at 6 (emphasis added).

The vehicle handling assumptions underlying the NPR are contradicted by CPSC's own limited testing of ROVs in different operating conditions. As Dr. Gillespie notes in his report:

> For example, it appears that the CPSC commissioned only limited testing on the disparity between ROV behavior on pavement and ROV behavior on surfaces such as dirt, sand, gravel, and other terrain where the vehicles are designed for operation. But even that limited testing revealed variances between oversteer and understeer depending on the surface type and run.

Id.

Such variances, Dr. Gillespie explains, "may be even greater on other off-road surfaces, such as rocky terrain, sand, or gravel." *Id.* at 7.

> More specifically, looking at the terrain and the tires, it is obvious that surface roughness commonly encountered by ROVs causes the tires to briefly lose contact with the surface. This is a very different condition from passenger cars, where tires rarely, if ever, lose contact with the road. Intermittent loss of contact with the surface effectively reduces the friction coupling and the surface appears more slippery than it actually is. Consequently, one of the significant challenges for ROV designers is to maintain traction coupling with the surface in order to develop the forces needed for propelling and maneuvering the vehicle.

Id.

Another "clear difference" between ROVs and on-road passenger cars that Dr. Gillespie identifies "is that ROVs may spend much of their time operating in a region of non-linear dynamic behavior arising from soft terrain." *Id.* In these intended operating environments, the "[y]ielding of terrain under the tires modifies the path of the vehicle and may leave obvious ruts behind the front wheels that interact with tracking of the rear wheels. Developing ROVs to accommodate these driving conditions is in marked contrast to that of passenger cars that operate on rigid, paved road surfaces." *Id.*

Together, these differences "mean that designing ROVs to meet smooth-road measures of handling performance is a speculative approach that does not ensure a vehicle with acceptable off-road performance. It is thus an unproven (and potentially unsound) basis for setting mandatory vehicle design and performance requirements." *Id.* at 8.

For these reasons, Dr. Gillespie expresses a need for "significant caution" in regulating ROV dynamic behavior, and urges CPSC to carefully reconsider its proposed handling requirements in the NPR. As Dr. Gillespie concludes:

> The criteria for acceptable performance [in the NPR] places great emphasis on avoidance of oversteer in a driving environment that is uncommon for ROVs. Placing such importance on steady state SAE oversteer on paved surfaces as an indicator of off-road stability is also speculative and overly simplistic. This is especially true with ROVs because the driver plays a very active role in the vehicle dynamics. * * * To restrict the vehicle performance envelope to understeer on paved surfaces will potentially compromise the responsiveness that many ROV drivers consider an important contributor to the agility needed for safe off-road operation. The loss in responsiveness reduces the driver's ability to stay on the desired driving path increasing the potential for crashes. *This is clearly a questionable basis for setting mandatory vehicle design and performance requirements.*

Id.

C. ROHVA Agrees That The Vehicle Handling Requirements In The NPR Should Be Carefully Reconsidered – And Ultimately Rejected – For The Same Reasons Identified By Dr. Gillespie

ROHVA likewise disputes CPSC staff's theories and conclusions about ROV handling, and strongly opposes the understeer mandate in the NPR. Such a federally-imposed requirement would be unprecedented and, as Dr. Gillespie has observed, could introduce unintended adverse risks for consumers.

Virtually all on-highway and off-highway vehicles exhibit understeer in some conditions and oversteer in other conditions, and can reach limit understeer in some conditions and limit oversteer in other conditions. There is no data showing that on-road passenger car drivers are generally aware of whether their vehicle understeers or oversteers, or that they prefer limit understeer to limit oversteer.[9] In fact, NHTSA has been unable to develop meaningful steering criteria for on-road vehicles despite decades of experience. In more than 100 years of on-highway and off-highway vehicle design, such a standard has never been established for steering characteristics.

Moreover, "limit understeer" involves loss of steering controllability and departure from the intended path "nose first," while "limit oversteer" involves loss of directional stability and possible "spin" (but typically not "drift," *i.e.*, "slide-out," which is more associated with neutral steer) and scrubbing off speed, and in some cases possible "tripping," which in some cases may lead to possible rollover. Thus, both "limit" conditions, which are characteristics of all vehicles, have potential safety implications.

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[9] *See* Dynamic Research, Inc., *Response to CPSC ANPRM on Recreational Off-Highway Vehicles (ROVs), Questions 3, 4, and 11* at 68 (Mar. 12, 2010) ("DRI Report") (submitted as Appendix 4 to March 15, 2010 Joint Comments of Arctic Cat, BRP, Polaris, and Yamaha to CPSC's Advance Notice of Proposed Rulemaking – Standard for Recreational Off-Highway Vehicles).

Some ROV users, in fact, prefer limit oversteer in the off-highway environment. As Dr. Gillespie observes, with this characteristic, the ROV tends to stay on the intended path rather than leave the path nose-first, which can be critically important in certain situations and on certain terrains that are commonly encountered during off-highway operation. Oversteer conditions can also help achieve superior traction in slippery off-highway environments. Requiring every ROV to exhibit understeer characteristics would disregard user preferences, eliminate the real-world benefits of oversteer, and create unintended and adverse risks.

Further, as Dr. Gillespie explains in significant detail, CPSC's proposed adoption of a circle test conducted on an asphalt surface to assess ROV steering characteristics fails to account for the off-highway nature of the vehicles. ROVs are not designed for use on paved surfaces but rather are designed and intended for off-highway driving on a wide range of surfaces and with fundamentally different tire dynamics. There is no standardized, repeatable, and reproducible off-highway test surface suitable for testing off-highway vehicle understeer/oversteer. And even if there were such a surface, the results would not be applicable to the wide range of other surfaces regularly occurring in the off-highway environment. CPSC's own limited testing of ROVs "revealed variances between oversteer and understeer depending on the surface type and run" – and such variations "may be even greater on other off-road surfaces, such as rocky terrain, sand, or gravel." *See* Gillespie Report at 7.

Critically, CPSC has not been able to show *any* correlation between understeer/oversteer and ROV crashes or rollovers. Although CPSC staff refers to the Rhino voluntary repair program in support of the proposed oversteer prohibition,[10] that voluntary program does not establish any such correlation. CPSC staff's claims about the Rhino are wrong and overstated.

[10] 79 Fed. Reg. at 68995.

As CPSC staff is forced to acknowledge in the NPR, the referenced Rhino-related incidents are extremely limited and not representative.[11] These incidents could be due to a large number of factors unrelated to – or unaffected by – the repair program. CPSC staff's "analysis" of these incidents does not even take into account the relative numbers of pre- and post-repair Rhinos in use, the effect of notification and additional warnings associated with the repair program, or jurors' consistent rejection of design defect and other claims about the original Rhino in multiple defense verdicts across the country.[12]

In short, CPSC staff's preferred understeer bias would require significant design changes for some vehicles without evidence that those changes would produce any benefits. Rather, as Dr. Gillespie concludes, CPSC's proposed understeer mandate is based on unproven, unsound assumptions and could result in unintended *adverse* consequences for ROV users. *See* Gillespie Report at 8. Finally, as Dr. Gillespie's conclusions demonstrate, in combination with CPSC's acknowledgment that it does not have sufficient data to show models that understeer have lower injury rates than models that do not (79 Fed. Reg. at 69004), CPSC has failed to provide the statutorily required substantial evidence to support issuance of the proposed understeer requirement. For these and other reasons identified by Dr. Gillespie, the vehicle handling requirements in the NPR should be rejected by CPSC.

[11] Briefing Package at 14 n.16. *See also* Exhibit 1 (JP Research Report at 2, 6, 7, Appendix A) (discussing these and other significant data quality problems with the Rhino and other ROV rollover incidents relied on by CPSC staff, as independently identified by JP Research).

[12] These and other critical points refuting CPSC staff's misplaced reliance on the Rhino repair program are more fully addressed in Yamaha's separate Comments in response to the NPR.

VII. CPSC DATA SHOW THAT ROV HANDLING CHARACTERISTICS ON PAVEMENT DO NOT NECESSARILY REFLECT THAT SAME VEHICLE'S HANDLING CHARACTERISTICS ON OFF-ROAD SURFACES

CPSC's proposed requirement that all ROVs exhibit understeer characteristics between 0.1 g and 0.5 g lateral acceleration during a slowly increasing steer test on pavement is based on its belief that vehicles with sub-limit oversteer can experience a sudden and exponential increase in lateral acceleration that represents a dynamically unstable condition. 79 Fed. Reg. at 68973-74. Conversely, CPSC believes that this condition does not develop in understeering vehicles. *Id.* at 68974. CPSC expresses the further belief that this condition can contribute to ROV rollover on level ground, especially on pavement. *Id.* at 68975.

CPSC appears to understand that for this proposed requirement to make sense, the steering characteristics exhibited by an ROV in the SIS test on pavement must correlate with the steering characteristics exhibited by that same vehicle on off-road surfaces, given that such surfaces are its primary use environment. To that end, CPSC staff provided the following response to previous comments from Carr Engineering and the ROVHA member companies that measurements of understeer/oversteer made on pavement are not applicable to non-pavement surfaces:

> Tests conducted on pavement show how the vehicle responds at lateral accelerations that range from low lateral accelerations (associated with low friction surfaces like sand) up to the highest lateral acceleration that can be generated by friction at the vehicle's tires. <u>This provides a complete picture of how the vehicle handles on all level surfaces</u>. The amount of friction at the tires, and thus, the lateral accelerations generated, varies on non-paved surfaces. <u>However, the vehicle's handling at each lateral acceleration does not change when the driving surface changes</u>.

Id. at 68988 (emphasis added).

Similarly, in responding to comments in ROHVA's July 31, 2014 letter to CPSC staff that understeer gradient measured on dry pavement does not reflect how the ROV will behave on off-highway surfaces, CPSC staff stated:

> SEA conducted tests to measure understeer gradients on a groomed dirt surface, and the report was published on the CPSC website in 2013 (footnote omitted). In this testing, vehicles displayed the same characteristics on a dirt surface that were measured on a paved surface, albeit less consistently and with reduced repeatability. From these test results, CPSC staff concluded that testing on paved surfaces represents the characteristics that will occur on unpaved surfaces and have the advantage that the test results will be more reliable than results obtained by testing on unpaved surfaces.

Briefing Package: Supplemental Information on Recreational Off-Highway Vehicles (ROVs) (October 17, 2014) at 15 (emphasis added).

In fact, and as Dr. Gillespie also independently observed above, these statements are not borne out by the actual SEA test data. SEA tested two vehicles, one that oversteered and one that understeered, respectively, on asphalt and on a prepared dirt surface. In a majority of the test runs, the vehicle's steering characteristic was found to be the reverse on the dirt surface. In three of six dirt surface test runs, vehicle F, which oversteered on asphalt, was found to exhibit understeer or neutral steer. In two of three test runs on dirt, vehicle G, which exhibited understeer on asphalt, was found to exhibit oversteer. These data do not show the two vehicles displaying the same characteristic on a dirt surface that was measured on a paved surface, but merely "less consistently." They show the vehicles displaying *reverse* characteristics on a dirt surface from those that were measured on a paved surface more often than not.

In an effort to build further support on this point, CPSC staff October 17, 2014 Supplemental Information Memorandum stated that the authors of a study of ROV handling that was cited by ROHVA "also conducted understeer gradient testing of ROVs and found corresponding results on dirt and pavement." *Id.* Unfortunately, this statement is not only

erroneous, but misleading. It appears to suggest that a study cited by ROHVA included understeer gradient testing of ROVs on both dirt and pavement and found corresponding results. In fact, the referenced study included testing of only a single ROV in three different configurations and only on dirt. Brown et al., Recreational Off-Highway Vehicles (ROV) Handling, SAE 2012-01-0239 (April 16, 2012) at 4-5. The vehicle was tested in its stock configuration that exhibited understeer, and with the rear sway bar removed that exhibited a more heavily understeer characteristic, and with the front sway bar removed which exhibited understeer transitioning to oversteer. The vehicle was not tested on pavement.

The study report noted that the modifications to the vehicle were not designed to exactly represent the range of steady-state responses of existing ROVs, and instead referred readers to the SEA test report for vehicle characterization data for a selection of ROVs, including steady-state handling characteristics. The report went on to warn:

> The steady state characterization used in this study, however, cannot be directly compared to that reported by SEA since the circle turn radius and loading conditions were not the same. That said, the circle turn results for the different suspension configurations indicate that the US+ set-up likely resulted in somewhat more understeer than ROVs in production while the response to the US-OS set-up appeared to be similar in character to some ROVs.

Id. at 5.

In other words, the study made clear the most that could be said was that the handling response of one configuration tested, which exhibited understeer to oversteer transition, appeared to be "similar in character" to "some" unidentified other ROVs which had been tested by SEA on asphalt. There is no mention of "corresponding results on dirt and pavement." Instead, CPSC all but ignores the SEA test data clearly showing that the steering characteristic results for each of the two vehicles actually tested on both dirt and pavement do not "correspond".

CPSC's proposal to require all ROVs to exhibit sub-limit understeer in an SIS test on asphalt in order to prevent the hazards that it posits from oversteer when the vehicles are used on off-road surfaces is thus arbitrary and unsupportable according to CPSC's own data, and cannot be included in any final rule establishing mandatory standards for ROVs. This is further evidence that the NPR vehicle handling requirement is not supported by substantial evidence as the CPSA requires.

VIII. CPSC'S PROPOSED J-TURN TEST REPRESENTS AN UNPRECEDENTED ATTEMPT TO USE LATERAL ACCELERATION AS A PASS/FAIL CRITERIA FOR DYNAMIC STABILITY

The NPR states that NHTSA evaluated the J-turn test as a method to measure rollover resistance of automobiles and found it to be the most objective and repeatable method for vehicles with low rollover resistance. 79 Fed. Reg. at 68970. The NPR goes on to state that for passenger automobiles with high rollover resistance, "the threshold lateral acceleration cannot be measured because rollover does not occur," thereby suggesting that the end point of the NHTSA J-turn was based upon a measurement of lateral acceleration at two-wheel lift ("TWL"). This is not the case.

The J-Turn as developed and specified by NHTSA was performed by using an individually specified steering wheel input magnitude for each vehicle and increasing the vehicle speed in 5 MPH increments from 35 to 60 MPH. (Forkenbrock, G. and Garrott, W. (2002), A Comprehensive Experimental Evaluation of Test Maneuvers That May Induce On-Road, Untripped, Light Vehicle Rollover Phase IV of NHTSA's Light Vehicle Rollover Research Program. DOT HS 809 513 at 82.) If TWL occurred, speed was reduced in 1 MPH increments until lift no longer occurred, and the lowest entrance speed at which TWL occurred was measured as the end point. *Id.* The other end point was reaching 60 MPH without TWL. The

test included the collection of data regarding vehicle speed, steering wheel angle, yaw rate, roll rate, roll angle and lateral acceleration.

However, as noted above, the end point result was the vehicle's speed, either the lowest entrance speed at which TWL occurred or reaching 60 MPH without TWL. While the NHTSA researchers concluded generally that vehicle speed, lateral acceleration and roll angle were "highly repeatable," they did not use the J-turn to determine as an end point the minimum lateral acceleration value at TWL. *Id.* at 89. NHTSA ultimately chose to use the fishhook test rather than the J-turn test in calculating its New Car Assessment Program, or NCAP, star ratings because none of the on-road light vehicles tested exhibited TWL in their nominal loading condition at or below 60 MPH.

The test therefore provided no discrimination in terms of rollover resistance as measured by the entrance speed at which TWL first occurs. *Id.* at 245-6. It was not, as the NPR suggested, because the threshold lateral acceleration for TWL cannot be measured. The key point is that the NHTSA J-turn did not use lateral acceleration at TWL as an end point, much less as a pass/fail criterion.

CPSC staff's October 17, 2014 Supplemental Information Memorandum asserts that "[v]ehicle test engineers commonly measure lateral acceleration to characterize the vehicle rollover stability." Supplemental Information at 2-3. The Memorandum then states that "[v]ehicle velocity, lateral acceleration, and steering wheel angle are basic test parameters that are specified in accepted standards" and gives the following three examples:

- SAE J266 Surface Vehicle Recommended Practices, Steady-State Directional Control Test Procedures for Passenger Cars and Light Trucks.

- Federal Motor Vehicle Safety Standard (FMVSS) No. 126 to require electronic stability control (ESC) systems on passenger cars.
- ISO 7401, Road Vehicles - Lateral Transient Response Test Methods - Open Loop Test Methods. *Id.* at 3.

In fact, while lateral acceleration is a measured value under all three of these standards, none of them use it as a pass/fail criterion for evaluating either lateral stability or rollover resistance.

SAE J266 measures the steady-state steering response of a vehicle by plotting lateral acceleration versus steering wheel angle. It does not mention - much less measure - lateral stability, and lateral acceleration is not used as either an end point or a pass/fail criterion. FMVSS 126 focuses on – and regulates – the yaw response of the vehicle, but no TWL is also a metric that must be satisfied. Although lateral acceleration is a measured value, the standard contains no requirement of any sort for it, much less specifies it as a pass/fail criterion. ISO 7401 focuses on the characterization of the vehicle's transient response during a step-steer maneuver and is similar to CPSC's proposed J-turn test. Here again, although lateral acceleration is measured, it is subject to no requirements and is certainly not used to establish pass/fail criteria for evaluating rollover resistance.

In addition, the introduction to the current version of ISO 7401 contains the following warning:

> Moreover, insufficient knowledge is available concerning the relationship between overall vehicle dynamic properties and accident avoidance. A substantial amount of work is necessary to require sufficient and reliable data on the correlation accident avoidance and vehicle dynamic properties in general and the results of these tests in particular. Consequently, any application this test method for regulation purposes will require proven correlation results between test results and accident statics. ISO 7401:2011 Introduction.

As explained more fully in Section IX.E below, CPSC has failed to prove any such correlation with respect to its proposed J-turn test.

IX. THE ROHVA J-TURN IS A SUPERIOR TEST FOR EVALUATING DYNAMIC LATERAL STABILITY THAN THE PROPOSED CPSC J-TURN

In the NPR, CPSC proposed a dynamic stability test procedure consisting of a 30 MPH dropped-throttle J-Turn that is repeated at successively greater steering wheel input angles until the vehicle reaches TWL. In order to pass the proposed test, the vehicle must achieve a lateral acceleration of greater than 0.70 g upon TWL.

ANSI/ROHVA 1-2014 also contains a 30 MPH dropped-throttle J-Turn dynamic lateral stability test. The ROHVA J-Turn, however, specifies a steering wheel input of 110 degrees and, in order to pass, the vehicle must not achieve TWL during the maneuver.

There are at least four key considerations when evaluating the appropriateness of a standardized dynamic test. They are whether the test procedure and resulting pass/fail metric:

a) Simulate a realistic use case;

b) Are repeatable;

c) Are reproducible; and

d) Are simple and efficient.

When evaluating J-Turn tests under these criteria, the ROHVA J-Turn surpasses the proposed CPSC J-Turn.[13]

A. Simulate A Realistic Use Case

The relevance and appropriateness of a dynamic stability test initially should be evaluated by whether it simulates a realistic use case, *i.e.*, a maneuver that drivers can do and actually

[13] For additional reasons why ROHVA's J-Turn surpasses CPSC's proposed J-Turn, *see* Exhibit 5, July 31, 2014 Letter from ROHVA to CPSC at 3-8.

perform. Stated differently, does the test have "face value"? This is important because standards should evaluate real-world performance with a connection to safety, rather than arbitrary, clinical metrics.

The ROHVA J-Turn replicates a real-world, evasive maneuver. A steering input of 110 degrees reflects a large single steer input without changing hand position on the steering wheel, such as an input that an operator would foreseeably make to avoid an obstacle in the trail. Indeed, executing such a steering input is a hands-on skill taught in ROHVA's ROV *Basic DriverCourse*.

The ROHVA J-Turn is similar to the "Throttle Release & Turn-In Test" conducted by Jaguar Land Rover for vehicles supplied to the United Kingdom Ministry of Defence (TP JLR 00 300). Like ROHVA's J-Turn, that test is intended to represent an instinctive, poorly-planned maneuver around an unexpected obstacle. The required maneuver, however, is not so severe that an inexperienced driver would expect the vehicle to tip. The idea that a wide spectrum of drivers have similar initial reactions to an unexpected obstacle is further supported in "Performance of Driver-Vehicle System in Emergency Avoidance," SAE 1977 and "Driver Crash Avoidance Behavior with ABS in an Intersection Incursion Scenario on Dry Versus Wet Pavement," SAE 1999. The magnitude of the response is clearly related to the size of the surprise. As a result, evaluating roll-over resistance at speed with a realistic steering wheel input is a relevant safety metric.

The proposed CPSC J-Turn, with a lateral acceleration pass-fail metric, is not reflective of real world use. For most vehicles, the steering inputs required to achieve TWL are significantly higher than those typically executed by ROV drivers. In a trail or other environment where intricate path-following is important, observation of a large number of

operators with widely varying skill levels by ROHVA member company engineers suggests that unskilled operators limit their steering inputs to avoid entangling their arms (or else significantly reduce their speed). This is not to suggest that larger steering inputs are not possible, merely that more skilled steering techniques such as "single hand palming" or "large rapid crossover" are required to do so. Forcing a vehicle to limit performance (*i.e.*, TWL) through an overly-aggressive steering input and then attempting to measure or extrapolate peak lateral acceleration at that limit does not evaluate how a vehicle behaves in normal or realistic operating situations.

B. Repeatability

Repeatability is the variation of the measurements obtained by one tester of the same item multiple times. A repeatable test is precise and robust. In order to evaluate the repeatability of dynamic stability tests, one must measure the same vehicle multiple times, using the same equipment, personnel and location at the same time.

ROHVA member company, Polaris Industries, conducted a study of the repeatability of CPSC's proposed J-Turn and ROHVA's J-Turn. In the study, four vehicle models were tested in 30 MPH dropped-throttle J-Turns. After beginning each vehicle at a sub-limit steering angle, the steering angle was increased in 5 degree increments until TWL occurred. Upon TWL, the steering wheel input angle and the maximum lateral acceleration, filtered at both 2Hz and 6Hz, were recorded. Each vehicle was run through this test sequence five times to the right and five times to the left. *See* Exhibit 4 (J-Turn Repeatability Study at Slide 2).

The superior repeatability of the steering wheel input angle metric over the lateral acceleration metric is demonstrated in multiple ways. Slide 3 of Exhibit 4 plots the results of each run for each vehicle as well as the average for each vehicle. The steering wheel angle measurements are virtually identical, making the resulting plots essentially lie on top of one another. This makes each vehicle/turn direction combination distinct from all others. The

variation among lateral acceleration results, however, is visually clear. The data spread makes some vehicle/turn direction combinations indistinguishable from one another.

Statistical analysis of the test results also demonstrates significant variability of the lateral acceleration metric. The Percent of Study Variation (%SV) measures the ability to distinguish between the performance of different vehicles. Low %SV indicates a superior ability to distinguish performance. A %SV of greater than 30% is considered an incapable measurement, while %SV of less than 10% indicates a very capable measurement. The %SV for the evaluated J-Turn metrics are:

- 6 Hz Lateral Acceleration: 36% study variation
- 2 Hz Lateral Acceleration: 21% study variation
- Steering Wheel Angle: 2% study variation

See Exhibit 4 at Slide 4. This analysis demonstrates that steering wheel angle is a very capable measurement method and significantly better than lateral acceleration at either filtering level.

The study results also were statistically analyzed by evaluating the Number of Distinct Categories. This value represents the number of non-overlapping confidence intervals that will span the range of individual vehicle set variation. In this analysis, less than five distinct categories reflects an unacceptable metric. Five or more categories may be an acceptable metric for repeatability, but more categories reflect increased confidence. The number of distinct categories for the measurements studied are:

- 6 Hz Lateral Acceleration: 3 distinct categories
- 2 Hz Lateral Acceleration: 6 distinct categories
- Steering Wheel Angle: 61 distinct categories

See Exhibit 4 at Slide 5. Again, this analysis shows that steering wheel angle has a great ability to distinguish vehicles, but lateral acceleration is not capable of doing so.

It is important to note that this study evaluated the repeatability of the precise steering wheel input angle at TWL. The ROHVA J-Turn, however, is not a limit test, so the particular steering wheel angle at TWL is not the applicable pass/fail metric. Rather, like NHTSA's non-limit pass/fail tests, the ROHVA J-Turn requires that the vehicle exhibit a particular behavior (*i.e.*, not achieve TWL) at a specific condition (*i.e.*, a steering wheel input angle of 110 degrees). When evaluating the repeatability of the ROHVA J-Turn in light of its actual pass/fail metric, this study demonstrated that the ROHVA J-Turn was 100% repeatable.

This study substantiates that steering wheel angle is an excellent metric for repeatedly measuring vehicle stability based on all statistical comparisons utilized. Filtering lateral acceleration down to 2Hz improves the repeatability of that metric,[14] but it is significantly less repeatable than steering wheel angle.

The results of this repeatability study are in stark contrast to the assertion in the NPR that SEA testing of four ROVs shows CPSC's proposed J-Turn test to be "very repeatable" with the standard deviation for sets of 10 test runs ranging from 0.002 g to 0.013 g.[15] 79 Fed. Reg. at 68972. That assertion is unconvincing for several reasons.

Numerous test runs were excluded from the SEA test results on repeatability. The test method included increasing steering wheel angle in subsequent test runs until TWL occurred. Multiple test runs were then made with that steering wheel angle. However, in many of these

[14] Although filtering lateral acceleration to 2Hz improves repeatability of the results, doing so reduces the average lateral acceleration value by .026 g versus filtering to 5Hz or 6Hz. Therefore, improving repeatability of the lateral acceleration metric effectively degrades vehicle performance in the test making the test arbitrarily more difficult to pass. For this reason, CPSC's proposed J-Turn the pass/fail threshold should be reduced by at least .026 g.

[15] Prior to issuance of the ROV NPR, ROHVA raised concerns about the lack of repeatability of CPSC's proposed J-Turn and produced data to substantiate those concerns on multiple occasions. *See* Exhibit 6 (ROHVA Update: Standards Development and Safety Programs, November 10, 2011) and Exhibit 7 (ROHVA/CPSC Technical Discussion, July 19, 2012).

test runs TWL did not occur. As explained in the October 17, 2014 Supplemental Information Memorandum, these test runs in which TWL did not occur were excluded from the study results because the value being studied, *i.e.*, lateral acceleration at TWL, was not reached. Supplemental Information at 8. However, testing by Carr Engineering indicated that in some cases a vehicle can experience a higher lateral acceleration value without TWL occurring than when TWL does occur at the same steering wheel angle. If some of the test runs excluded by SEA in fact indicated higher lateral acceleration values than those measured in the test runs that did experience TWL, and thus were included, then those lower included results are called into question.

CPSC staff asserts that the rollover resistance of an ROV is defined by the lateral acceleration measured at TWL because the ROV vehicle rolls over after this value is exceeded. *Id.* If the measured values for lateral acceleration in some of the excluded test runs where TWL did not occur were higher than the value measured in included runs with TWL, then this statement is not true. CPSC needs to conduct a re-analysis of the SEA data for the excluded test runs in order to address this issue.

In addition, SEA's own comparison of its repeatability test data gathered in 2013 with its earlier lateral acceleration measurements for those same vehicles in 2011 indicates much greater variability than suggested by the 2013 repeatability studies themselves. More specifically, SEA found variations in these two sets of data of up to 0.027 g or approximately 4% of the measured value. *Id.* This level of measured variability in testing by the same test entity at the same test location with the same vehicle but on a different date is of great concern because four of the 10 ROVs tested by SEA had lateral acceleration values within 4% of the proposed pass/fail criteria of 0.70 g. Furthermore, there is only a 4.3% difference between the measured lateral

acceleration for Vehicle A, which CPSC indicates it views as presenting an unreasonable risk, and the pass/fail criteria of 0.70 g, which CPSC proposes represents a vehicle that does not present such a risk. In other words, the variability which SEA itself has found in its own testing is too large for CPSC's proposed J-Turn test method to credibly and inconsistently distinguish between vehicles that comply with the proposed requirement and those that do not.

C. Reproducibility

Reproducibility is the variation of measurements obtained, of the same item, when the test is duplicated by different people at different times and in different locations. A reproducible test can be replicated. In order to evaluate the reproducibility of dynamic stability tests, one must measure the same vehicle multiple times, using the same process, but with different personnel, locations and times.

CPSC has presented no J-Turn test results from test entities other than SEA at different locations and test facilities. Without such data, CPSC cannot credibly demonstrate that the proposed J-Turn test method can be employed successfully by other test entities, whether test labs or manufacturers themselves, in other locations. CPSC cannot and should not proceed to mandate a dynamic stability test method which, even accepting CPSC's conclusions regarding repeatability, has been successfully employed by only one test entity at one test location. This would threaten to create monopoly pricing power and serious logistical and scheduling difficulties for all ROV manufacturers in both the U.S. and abroad.

ROHVA, however, is aware of two recently completed J-Turn reproducibility studies.[16] Subsequent to issuance of the ROV NPR, CPSC, through SEA, conducted such a study. As of

[16] ROHVA also previously shared with CPSC staff the results of dynamic testing conducted by ROHVA's contractor, Carr Engineering, Inc., which demonstrated that SEA's Lateral Acceleration J-Turn results were not reproducible by Carr Engineering (whereas Kst and tilt table results were reproducible). *See* Exhibits 6 and 7.

the date of the filing of these comments, CPSC has not published the results of its reproducibility study. ROHVA is eager to review the CPSC study and will be requesting a re-opening of the ROV NPR comment period in order to address the results of the study. In addition, the Outdoor Power Equipment Institute (OPEI), an industry organization that has developed voluntary standards for some vehicles within the scope of the ROV NPR, has conducted a reproducibility study. Two ROHVA member companies (Polaris and John Deere) participated in the OPEI study, and ROHVA understands that the results of that study will be submitted to CPSC in OPEI's comments to the NPR.

ROHVA expects that both CPSC's and OPEI's reproducibility studies will demonstrate that performance-based pass/fail metrics (*i.e.*, no TWL) at specified steering wheel input angles, like the ROHVA J-Turn, are significantly more reproducible than limit-based pass/fail metrics (*i.e.*, lateral acceleration at TWL) in CPSC's proposed J-Turn. When a vehicle approaches its stability or handling limit, its behavior becomes inconsistent and unpredictable because, by definition, it is exceeding its intended performance envelope. In addition, tests like the ROHVA J-Turn do not require several repeats of the test to achieve a result. Less repeats means less tire wear which is a significant factor in test variation.

Moreover, as demonstrated by Polaris' repeatability testing, certain limit-based metrics, such as steering wheel angle at TWL, are less prone to variation than others, such as lateral acceleration at TWL. As a result, ROHVA expects reproducibility testing will reveal as much or more variation in CPSC's proposed J-Turn as the repeatability testing showed.

D. Simplicity And Efficiency

Finally, when establishing a dynamic stability test for a standard, one should construct a test that is simple and efficient. Simplicity is important because it reduces the likelihood of test execution error, which is a significant factor in variation that degrades repeatability and

reproducibility. Efficiency also is valuable because it results in quick test cycles that enhance product development and evaluation. ROHVA's J-Turn is both simpler and more efficient than CPSC's proposed J-Turn.

The equipment required to conduct the ROHVA J-Turn consists only of outriggers and a steering robot or manual steering stop. Because it is not a limit-based test and the steering wheel input angle is specified, the ROHVA J-Turn does not require several runs, which would lead to tire wear and increased time. Moreover, the results are apparent on the test pad; a simple observation evaluates pass/fail. No filtering or post-processing is required.

CPSC's proposed J-Turn, on the other hand, is a complicated test. In addition to outriggers, the test requires a steering robot as well as a calibrated 3-axis accelerometer, a calibrated 3-axis gyroscope and a data recorder. Results are unknown upon completion of the testing and are determined in the computer lab. Test data needs to be extracted from the data recorder, post-processed by filtering and then averaged. Use of several processes and pieces of equipment increases the opportunities for error and makes analysis unnecessarily time-consuming and costly.

In particular, the test method requires that the center of gravity of the test vehicle, including the test equipment and ballast, be no more than 0.5 inch below (and within 1.0 inch in the x-axis and y-axis directions) the CG of the vehicle as it is sold at retail. SEA used its Vehicle Inertia Measurement Facility ("VIMF") to confirm that each test vehicle met this requirement. The VIMF costs more than $500,000 and is available at few, if any, test labs other than SEA. The test method also requires that vehicle acceleration in all three axes be measured to an accuracy of $\pm$ 0.003 g. In order to do this given the substantial "noise" in the data, the test method requires that the data be digitally low-pass filtered to 2.0 Hz using a phaseless, eighth-

order Butterworth filter. Finally, the peak ground plane lateral acceleration occurring between the time of the steering controller input and the time of TWL is to be found on the resulting filtered curve and recorded.

These test method specifications are highly complicated because of the difficulty inherent in reliably measuring minimum lateral acceleration at the limit performance stage of TWL for use as a pass/fail criterion. Moreover, the fact that there are few if any test labs other than SEA capable of making the necessary center of gravity measurement under the methodology represents a substantial impediment to test reproducibility.

It appears that one of the key reasons for the different lateral acceleration results of the Carr Engineering testing as compared to SEA's test reports may have been Carr's placement of the test equipment package on the front seat to simulate a passenger, rather than in the cargo bed closer to the vehicle center of gravity. A test method that is this sensitive to any change in CG location due to test vehicle set-up should not be included in mandatory standards that apply to manufacturers located in all different geographic areas of the United States as well as in foreign countries where there may be no test facility capable of confirming proper CG location under the test method.

E. CPSC Has Failed To Provide Substantial Evidence To Support The NPR J-Turn

The NPR J-turn must be supported by substantial evidence that it will reduce the potential injuries CPSC has identified as associated with ROV operation. CPSC has failed to meet this statutory requirement.

First, CPSC has explicitly acknowledged that:

> Although the Commission believes that the dynamic lateral stability and vehicle handling requirements will reduce the number of deaths and injuries involving ROVs, it is not possible to quantify this benefit because we do not have sufficient data to estimate the injury rates of models that

> already meet the requirements and models that do not meet the requirements. Thus, we cannot estimate the potential effectiveness of the dynamic lateral stability and vehicle handling requirements in preventing injuries. 79 Fed. Reg. at 69004.

In other words, CPSC concedes it lacks the data to demonstrate ROV models that understeer and meet the proposed 0.70 g minimum lateral acceleration requirement have lower injury rates than ROV models that do not meet these requirements. This in turn means that CPSC lacks the data, much less the required substantial evidence, to demonstrate that the proposed dynamic lateral stability and vehicle handling requirements will eliminate or reduce deaths and injuries involving ROVs. CPSC's unsupported "belief" that the proposed requirements will do so cannot change the stark reality that the agency lacks the necessary evidentiary basis to make this essential finding for issuing a final rule including these NPR requirements.

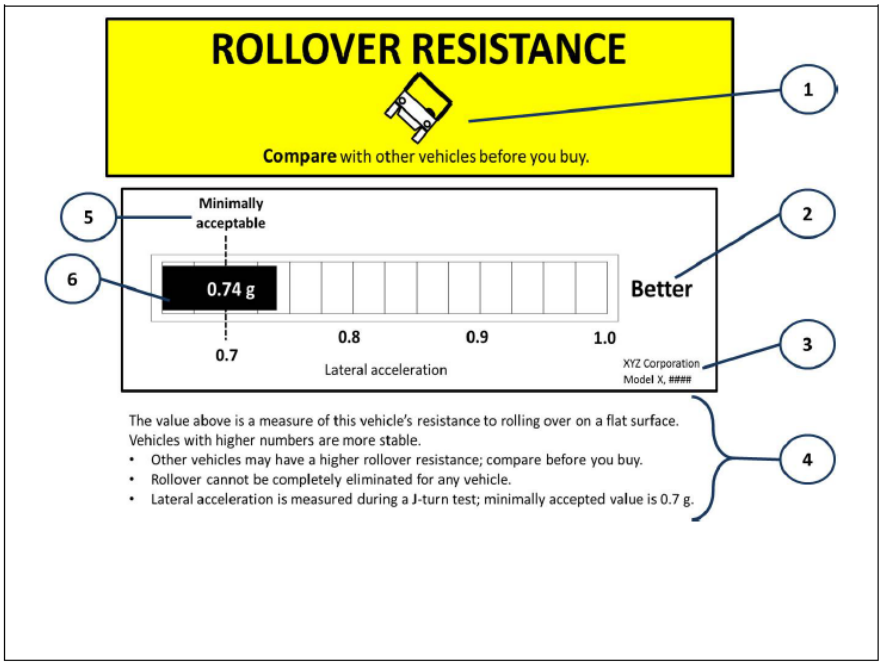
CPSC's attempt to bootstrap evidentiary support for these proposed requirements from its analysis of Rhino-related incidents is unavailing. First, the Rhino-related incidents of which CPSC is aware are only those reported to the agency by third parties – many of whom were self-interested litigants – and, as CPSC acknowledges, "are not representative of all incidents." Briefing Package at 14 n.16. Second, even if CPSC's analysis were correct with respect to the Rhino, it reflects only one discontinued ROV model. It does not address the other nine models which CPSC itself has tested through SEA, much less the many more numerous models in the market contemporaneously and more recently. Without broader analysis of numerous other models, particularly vehicles that are currently being marketed, CPSC's Rhino analysis, even assuming solely for argument's sake it were correct, would not constitute substantial evidence with regard to the proposed dynamic lateral stability and vehicle handling requirements for future ROVs generally.

In addition, as shown in Section V above, the "dominant hazard pattern" of lateral rollover identified by CPSC from the 2003-2011 incident data at which the NPR J-turn requirement is aimed no longer represents a majority of ROV rollovers. Moreover, the JP Research evaluation of the incident data shows that the J-turn requirement would not have prevented the lateral rollover in most cases in any event. This is a further indication of the absence of substantial evidence to support the proposed J-turn requirement.

X. CPSC'S PROPOSED HANG TAG IS NOT AUTHORIZED UNDER CPSA SECTION 27(e) AND WILL MISLEAD CONSUMERS

The following Figure from the Notice of Proposed Rulemaking depicts CPSC's proposed hangtag for ROVs:

Figure 16—Hang tag[43]



The proposed hang tag would depict a particular model ROV's minimum lateral acceleration at two wheel lift as determined by the NPR J-turn test on asphalt on a sliding scale from approximately 0.65 to 1.0 (presumably omitting the "g" for simplicity). In addition, it indicates a value of 0.70 is "Minimally acceptable" and that closer to 1.0 is "Better." The

minimally acceptable 0.70 value represents the proposed pass/fail criteria in the NPR J-turn test. Finally, it advises consumers to "**Compare** with other vehicles before you buy." (Emphasis in original.)

In making this proposal, CPSC cites Section 27(e) of the CPSA, 15 U.S.C. § 2076(e) which authorizes CPSC to require manufacturers to notify consumers at the time of original purchase of performance and technical data "related to performance and safety as may be required to carry out the purposes" of the CPSA. 79 Fed. Reg. at 68993 (emphasis added). It further cites Section 2 of the CPSA which provides that one of the statutory purposes is to "assist consumers in evaluating the comparative safety" of products. *Id.*

Therefore, the proposed hang tag is authorized only if it provides safety-related data that assists the consumer in making a comparative safety evaluation among ROV models. The problem is that CPSC expressly acknowledges in the NPR that it "do[es] not have sufficient data to estimate the injury rates of models that already meet the requirements and models that do not meet the requirements." 79 Fed. Reg. at 69004. CPSC goes on to further admit that "we cannot estimate the potential effectiveness of the dynamic lateral stability and vehicle handling requirements in preventing injury." *Id.* In other words, CPSC has no data to show that ROVs with lateral acceleration of 0.70 g and above have lower injury rates, *i.e.*, are safer, than ROVs with lateral acceleration below 0.70 g.

This means that not only is CPSC unable to demonstrate that a lateral acceleration value for ROVs of 0.70 g is "minimally acceptable" for safety, it has no data to support instructing consumers that any ROV with a lateral acceleration value closer to 1.0 is "better" – which consumers will understand to mean safer – than an ROV with a lateral acceleration value less close to 1.0. The proposed hang tag is thus fundamentally misleading because it directs

consumers to make a comparative safety evaluation based on lateral acceleration values that have not been demonstrated to correlate to safety. The consumer may think he is buying a safer ROV (and willingly paying more to do so) when in fact that is not the case. The proposed hang tag is also correspondingly not authorized under Section 27(e) of the CPSA because CPSC has not shown that the lateral acceleration data relates to safety.

CPSC notes that NHTSA requires automobiles to come with comparative information on vehicles regarding rollover resistance. (49 C.F.R. 575.105.) 79 Fed. Reg. at 68993. CPSC's attempt to rely on NHTSA's action is unavailing. In the first place, this NHTSA requirement is based on a static stability metric, SSF. The NPR explicitly rejects using SSF as a lateral stability or rollover resistance metric for ROVs. 79 Fed. Reg. at 68981, 68987. Secondly, NHTSA has correlated vehicle SSF values to vehicle rollover rates through analysis of hundreds of thousands of rollover incidents, and based its comparative SSF sliding scale on that accident data. As noted above, CPSC has no such data and has failed to correlate its proposed dynamic stability metric, lateral acceleration, to either injury or accident rates. As with the proposed J-turn requirement, CPSC has failed to provide the required substantial evidence to support the proposed hang tag requirement.

XI. CPSC'S SEATBELT PROPOSALS BLUR THE DISTINCTION BETWEEN DRIVER- AND PASSENGER-SIDE SPEED-LIMITERS, MISCHARACTERIZE CURRENT TECHNOLOGY, AND (ERRONEOUSLY) PRE-JUDGE THE RESULTS OF BELATED CONSUMER TESTING

CPSC proposes requiring "that the speed of an ROV be limited to a maximum of 15 MPH, unless the seatbelts for both driver and any front passenger seats are fastened." 79 Fed. Reg. at 68995. According to the NPR, CPSC "believes that in-vehicle technology that limits the speed of the ROV if the front occupied seats are not buckled will be accepted by ROV users because the technology does not interfere with the operation of the ROV below the threshold

speed, and users will be motivated to wear seatbelts if they wish to exceed the threshold speed." *Id.* That belief is purportedly premised on the fact that "speed-limitation technology" is already included in some ROVs and the results of the Westat Phase 1 study. *Id.*

CPSC staff incorrectly report use of this technology, and the proposal is contradicted by the CPSC-commissioned Westat Phase 2 consumer acceptance study. *First*, none of the ROV manufacturers sells an ROV with a passenger-side speed-limiter. *Second*, among the manufacturers who include a *driver-side* speed-limiter, that technology only works in ROVs with electronic throttle control; *i.e.*, speed-limiter does not work in a diesel engine or an engine with a carburetor because there is no electronic control unit. *Third*, a passenger-side speed-limiter raises myriad problems, ranging from technological challenges to the driver's loss of control over the vehicle. *Fourth*, according to the consumer acceptance study commissioned by CPSC, consumers are strongly opposed to a passenger-side limiter. *Fifth*, when properly analyzed, the costs of a passenger-side seatbelt speed-limiter significantly exceed the benefits. *Finally*, approximately 60% of Model Year 2015 ROVs already include a driver-side speed-limiter, and ROHVA member companies have discussed with CPSC staff adding a required driver-side speed-limiter to the ANSI / ROHVA voluntary standard, which as noted in Section XVI has been reopened for potential revision through the canvass process in which CPSC is a participant.

A. Driver-Side Seatbelt Speed-Limiters Can Be Implemented By MY 2018

The ANSI / ROHVA 1-2014 voluntary standards require *either* a driver-side seatbelt speed-limiter *or* an FMVSS 208-style audible alert. Approximately 60% of Model Year 2015 ROVs already include a driver-side speed-limiter. Further, ROHVA member companies have discussed with CPSC staff revising the voluntary standards to require a driver-side speed-limiter in ROVs with electronic throttle control and a maximum speed above 30 MPH by Model Year 2018. This lead time is necessary because adding a driver-side speed-limiter in all new

ROVs will mean adding a driver-side seatbelt sensor, a gas-pedal actuated sensor, a throttle body position sensor linked to the electronic control unit (ECU), and an LCD display with the applicable messaging. All of which must be engineered, validated, and tested to avoid unintended safety consequences, such as sudden loss of acceleration or sudden deceleration if the seatbelt sensor malfunctions. Given that ROVs are used in rugged and varying terrain, system reliability in all conditions must be carefully validated.

To put that testing and development in context, one ROV manufacturer implemented a driver-side speed-limiter in Model Year 2011. That company's ROVs already included electronic throttle control and an ECU. Nonetheless, it still took approximately 18 months to develop the technology for one engine type and configuration. That is six months longer than CPSC proposes for all ROV manufacturers to develop both driver- and passenger-side speed-limiting technologies, even for those companies whose ROVs do not have electronic throttle control or an ECU. An ROV manufacturer with an independent engine supplier faces even more difficulties.

Making things even more complicated, speed-limiter technology does not work with diesel engines or engines with carburetors. ROHVA understands that CPSC staff have recognized those technological limitations. Nonetheless, the NPR makes no effort to distinguish between these engines or acknowledge the very real challenges associated with implementing this technology.

B. There Would Be Significant Challenges And Risks To Implementing Passenger-Side Seatbelt Speed-Limiters

The ROHVA member companies have made a reasonable determination not to include passenger-side interlocks based on current technologies, vehicle uses, the off-highway environment, and other factors. One such factor is the "Captain of the Ship" principle that is

reflected in CPSC data, which generally means that passengers follow the driver's seatbelt use. As the National Highway Traffic Safety Administration (NHTSA) has noted:

> One observation from Nuyts and Vesentini (2005) is that whatever the general trend of influence, "drivers and passengers often behaved the same. They both wore or did not wear a seatbelt." Nambisan and Vasudevan (2007) collected extensive observational data on driver and passenger seatbelt use over a three year period for 50 sites in Nevada. Seatbelt use by drivers and passengers was not independent and the effects were quite large. Under various conditions (age and gender mixes, rural/urban, etc.), **when the driver was belted, the observed rate of belt use for passengers was usually over 90 percent**. (NHTSA, "Effectiveness and Acceptance of Enhanced Seatbelt Reminder Systems: Characteristics of Optimal Reminder Systems," February 2009, at 66 (emphasis added).)

One of the most serious issues with a passenger-side seatbelt speed-limiter is the passenger taking control of the ROV by unbuckling his or her seatbelt. As discussed below in Section XI.C, this is among consumers' biggest concerns with the passenger-side speed-limiters. Whether done as a joke or simply to get more comfortable, if a passenger unbuckles the seatbelt while the ROV is moving up/down/across a slope or through snow, mud, icy conditions, or other rugged terrain and thereby causing the ROV to lose power, a dangerous situation has been created that is beyond the driver's control.

Another issue is that while there always is a driver in the driver-seat, there is not always a passenger. That means the passenger-seat must be able to "know" when a person is sitting in it, as compared to being empty or when a toolbox or a dog is placed on the seat, for example. Therefore, in addition to the required seatbelt sensor, seat weight sensor and speed sensor signals that must "talk" to the ECU, protocol software needs to be in place for continuous validation between weight and seatbelt sensor in a closed loop as well as weight sensor calibration.

That is difficult, even more so for ROVs with a bench-seat. And it is further complicated because passenger-seat sensors must be water- and elements-proof, a situation made more difficult because passenger seats are sometimes removed by drivers in order to make room for

cargo, thus exposing the sensors. Given that ROVs are used in the rain, mud, and snow, the sensors must be truly conditions- and use-proof. Then the owner must be able to put the system back together so that it works properly when a passenger is again seated, or the ROV will not exceed 15 MPH.

C. CPSC's Commissioned Consumer Acceptance Study Contradicts CPSC And Highlights Concerns About Passenger-Side Speed-Limiters

CPSC hired Westat to conduct testing regarding consumer acceptance of seatbelt speed-limiters. The resulting report – "User Acceptance and Effectiveness of Seatbelt Speed Limiters on Recreational Off-Highway Vehicles - Phase 2: Field Test Focus Group" ("Westat Phase 2") – was released to the public by CPSC on or about March 16, 2015. The report refutes CPSC's claim in the NPR that "ROV users are likely to accept a 15 MPH threshold speed limitation," especially as applied to passenger seats. 79 Fed. Reg. at 68995.

The objective of the study was "to provide CPSC with systematic and objective data to support agency decision making with regard to ROV restraint system requirements related to seatbelt speed limiter technology." (Westat Phase 2 at 2.) The report notes, "In general, acceptance of the speed limiter appeared to be low among participants." *Id.* at 26. Those who were against implementation of a speed-limiter cited several reasons, including:

- personal freedom
- efficiency
- impediment to safety / evading dangerous situation / riding conditions
- additional electrical system that could malfunction or break
- would not affect decision to wear seatbelt (*Id.* at 27-28.)

Participants were especially opposed to passenger-side seatbelt speed-limiters. "Participants said that they would hate to have the speed of ***their*** vehicle linked to a decision made by a passenger." *Id.* at 28 (bold in original). They also voiced concerns about the seat sensor being able to differentiate between passengers and other loads: "Others were concerned

with the sensor having difficulty differentiating the human passenger from other heavy objects that the rider might place on the seat." *Id.* The report labels this broad opposition to passenger seatbelt speed-limiters as "not surprising[]." *Id.* If CPSC had simply waited for Westat to complete testing, instead of electing to commence the rulemaking process and pre-judging the Westat results, CPSC could have avoided spending time and money on this proposal.

When properly analyzed, the costs of a passenger-side seatbelt speed-limiter significantly exceed the benefits. As discussed in more detail in Section XII, ROHVA conducted a review of CPSC's preliminary regulatory analysis with respect to the estimated costs and benefits of the passenger-side seatbelt speed limiter. *See* Morrall Report at Exhibit 3. Relying upon more reasonable assumptions and OMB's best practices methodology and guidance for cost/benefit analysis, Dr. Morrall concluded that after applying necessary adjustment factors and taking into account costs of disutility and system failure that were not quantified by CPSC, total costs per vehicle range from $100 to $190, compared to estimated lifetime benefits of $55. This analysis shows that the costs of the proposed passenger-side seat belt speed limiting interlock significantly exceed the estimated benefits. CPSC accordingly lacks the factual basis to make the required finding that the estimated benefits of this proposed requirement bear a reasonable relationship to its costs.

XII. THE NPR'S COST/BENEFIT ANALYSIS ADMITTEDLY IS INSUFFICIENT AND FAILS TO MEET APPLICABLE LEGAL REQUIREMENTS

The NPR includes a purported analysis of costs and benefits prepared by CPSC staff. Section D of the NPR is entitled "Requirements of the Proposed Rule: Costs and Benefits." The introductory paragraph of that section acknowledges that that section "is a discussion of the costs and benefits that are **expected** to be associated with the requirements of the proposed rule." 79 Fed. Reg. at 69002 (emphasis added).

A. CPSC's Cost/Benefit Analysis Of Lateral Stability And Vehicle Handling Requirements[17]

As noted in Section IX.E. above, Section D of the NPR states:

> Although the Commission **believes** that the dynamic lateral stability and vehicle handling requirements will reduce the number of deaths and injuries involving ROVS, it is not possible to quantify this benefit because we do not have sufficient data to estimate the injury rates of models that already meet the requirements and models that do not meet the requirements. **Thus, we cannot estimate the potential effectiveness of the dynamic lateral stability and vehicle handling requirements in preventing injuries."**

Id. at 69004 (emphasis added).

The next section of the NPR, Section E, is entitled "Summary of the Costs and Benefits of the Proposed Rule." There, CPSC repeats that "the potential benefits of the lateral stability and vehicle handling requirements could not be quantified. . . . [W]e have not developed the data necessary to quantify these benefits. * * * At this time . . . we do not have a basis for estimating what would be the effectiveness of the lateral stability and vehicle handling requirements." *Id.* at 69011.

Apparently recognizing its deficiency and searching for some justification to support its benefits analysis, the NPR focuses on CPSC's intent for the proposed lateral stability and vehicle handling requirements. The NPR notes "these requirements are **intended** to reduce the risk of an ROV rolling sideways when making a turn." 79 Fed. Reg. at 69004. On the basis of that specified intent, the NPR then cites general estimated societal cost of deaths and injuries associated with ROVs modified by a factor of 35% (CPSC's stated percentage of the injuries occurring when an ROV rolled sideways when making a turn). *Id.*

[17] CPSC's analysis divided the NPR requirements into two general categories: (1) Lateral stability and vehicle handling requirements, and (2) Occupant-retention requirements.

But, as noted in Section V.B.2 above, although CPSC intended that the proposed dynamic lateral stability and vehicle handing requirements address specific lateral rollover scenarios, JP Research determined that only 12% of the reported incidents that CPSC coded as "rolled sideways while making a turn" involved these specific rollover scenarios. Regardless of the percentage of incidents with such specific rollover scenarios, CPSC's attempt to satisfy its legal burden with a reference to its "intent" for proposing the lateral stability and vehicle handling requirements is legally insufficient. As discussed above in Section IV regarding Rulemaking Statutory Requirements, CPSC must provide findings based on facts. And importantly, CPSC admittedly cannot satisfy this obligation—a requirement CPSC must meet before it can impose the lateral stability and vehicle handling requirements on ROVs.

CPSC's estimates of testing costs for lateral stability and vehicle handling also are understated. As discussed in Section IX above, the repeatability and reproducibility concerns, including center of gravity issues with the testing protocol, would lead to significantly higher costs than CPSC's estimates for the proposed dynamic lateral stability and vehicle handling tests. Additionally, CPSC's costs estimates are based on the erroneous assumption that testing would be necessary only when a model is first brought to market. 79 Fed. Reg. at 69002. It ignores that further testing may be required if there are component changes or design modifications during a particular model's lifecycle.

B. CPSC's Cost/Benefit Analysis Of Occupant Retention Requirements

As an initial point, the NPR discusses only seatbelt speed limiters in its analysis of the costs and benefits of occupant retention requirements. *See generally* 79 Fed. Reg. at 69004-11. It is significant that about 60% of the current ROV market already has driver-side seatbelt speed limiters. The NPR itself acknowledged that "[m]ost ROVs already have some occupant protection barriers or structures. In some cases, these structures might already meet the

requirements of the proposed rule." *Id.* at 69004. As a result, adoption of the proposed rule will not provide the additional benefits calculated by the NPR since the market is already largely providing such benefits.

C. The NPR Does Not Meet Regulatory Planning And Review Legal Requirements

As Dr. John Morrall explains,[18] Circular A-4, "Regulatory Analysis," issued from the Office of Management and Budget (OMB], provides the "best practice" guidance for good regulatory analysis and standardizes the way benefits and costs of regulatory actions are measured and reported in accordance with Executive Order 12866 through a three-step process.[19] The first step is to determine the need for the proposed regulatory action, including whether the action is intended to address a significant market failure. The second step is to determine the alternative approaches. The third step is "to perform an evaluation of the benefits and costs—quantitative and qualitative—of the proposed action and the main alternatives identified by the analysis." *Id.* at 2.

1. CPSC failed to determine the need for the regulatory action under consideration and there has been no market failure

As Dr. Morrall states in his report, CPSC has not addressed whether a significant market failure exists or, if it does exist, why its particular proposal is needed to correct that market failure. Morrall Report at 3. CPSC's test data cited in the NPR is based on ROVs that were

[18] Dr. Morrall is an independent economics consultant who worked for the Office of Management and Budget (OMB) and the Council of Wage and Price Stability in the Executive Office of the President from 1975 to 2008 reviewing regulatory impact analyses from Federal agencies including CPSC and DOT as well as formulating guidance on best practices for regulatory analyses. (Morrall Report at 1).

[19] https://www.whitehouse.gov/sites/default/files/omb/assets/regulatory_matters,, pdf/a-4.pdf.

manufactured in 2010 or before. ROVs have undergone substantial design changes since then.[20] And while apparently most of the quantified benefits identified by CPSC staff seem to arise from the proposed driver-side seatbelt speed-limiting interlock, approximately 60% of the ROVS sold in Model Year 2015 (the current model year) already had this feature. Additionally, as noted more fully in Section XVI, CPSC staff and the ROV industry have been meeting and discussing making the driver-side seatbelt speed-limiting interlock a requirement under a revised voluntary standard. As Dr. Morrall concludes, "obviously there can be no market failure under this analysis."

2. CPSC failed to adequately consider alternative approaches to the proposed rule

As determined by Dr. Morrall, the NPR's brief discussions of several more intrusive and less intrusive alternative provisions with dismissals of those alternatives based on staff opinions and beliefs rather than analyses does not meet the OMB requirements. Dr. Morrall highlights CPSC's inconsistent approaches to analyzing the voluntary standards as compared to its proposed rule. For example, while the NPR states that CPSC engineering staff "does not believe that the tests procedures in either [voluntary] standard have been validated properly to be deemed capable of providing useful information about the dynamic stability of the vehicle," CPSC supports its proposed dynamic stability provisions without any benefits analysis. 79 Fed. Reg. at 69012.

Dr. Morrall also highlights that the NPR summarily dismisses an option of requiring

[20] Apparently because of those changes, CPSC staff have changed their position on features such as occupant retention requirements. As recently as March 2011, CPSC staff sought a change in the ANSI/ROHVA voluntary standards to incorporate a requirement for an active seatbelt reminder dependent on the latch status of the seat belt. (*See* Exhibit 8 at 3). At that time, although at least one company had a seatbelt speed limiter interlock system on its publicly-available ROVs, CPSC staff did not specify such a requirement. As previously noted, ROV models have been changing over time.

one or the other of stability provisions or handling requirements based on CPSC's belief that both are better than either one. "According to [CPSC engineering staff], a vehicle that meets both the dynamic stability requirement and the understeer requirement should be safer than a vehicle that meets only one of the requirements." *Id.* (emphasis added). Yet, CPSC admittedly cannot provide any benefit estimates of its proposed handling and stability requirements to corroborate this presumption.

Finally, Dr. Morrall concludes that the NPR's brief descriptions of these alternatives "do not meet OMB best practices. They do not provide an adequate or reasonable record of costs and benefits to enable a fact based choice among them." Morrall Report at 6. ROHVA endorses Dr. Morrall's conclusions.

3. CPSC's failure to perform a quantitative and qualitative evaluation of the benefits and costs resulted in overestimation of benefits and underestimation of costs

Dr. Morrall provides a detailed analysis of the many ways in which the NPR's cost/benefit analysis is misleading and fails to comply with OMB's best practices guidance. The first concern is CPSC uses static data from one year, 2010, as the baseline against which to project benefits from the proposal forward from 2017 to 2035 and possibly beyond. *See* Morrall Report at 6-7. As Dr. Morrall notes, the OMB guidance advises agencies to use a baseline that is "the best assessment of the way the world would look absent the proposed action" and recommends that, in particular, agencies consider such factors as:

- evolution of the market,
- changes in external factors affecting expected benefits and costs,
- changes in regulations promulgated by the agency or other government entities, and

- the degree of compliance by regulated entities with other regulations.[21]

The NPR did not consider any of these factors. Rather CPSC analyzed its proposed requirements as the world was in 2010 – five years ago. It ignored the positive trends in statistical safety records, state laws, voluntary standards, industry pro-safety innovations, and consumer behavior.

Additionally, Dr. Morrall concludes that the NPR also used old and limited data to estimate the societal costs of injuries associated with ROVs and that this approach tended to increase the uncertainty and possibly bias upwards CPSC value estimates. For example, the NPR relied on a sample of only 16 interviews out of 2,018 NEISS cases involving an ATV or UTV (and ROVs) conducted over an eight-month period from Jan 1,2010 to August 31, 2010. CPSC used those 16 interviews to project through a series of questionable steps that 11,100 medically treated injuries from ROVs in 2010 at a societal cost of $326.2 million in 2012 dollars or about $572 per ROV. Dr. Morrall concludes that these numbers "seemed implausibly high on their face when compared to ATVs." Morrall Report at 9. He concludes that OMB would have rejected the survey response rate used by CPSC as too low, and that the projection rates were "highly questionable from a statistical viewpoint." *Id.* at 10-11. And further that CPSC overestimated injury costs based on a discredited model that is not consistent with OMB Regulatory Analysis guidance and is not used by the executive branch agencies. *Id.* at 11-13. ROHVA endorses all of Dr. Morrall's conclusions.

Dr. Morrall also analyzes CPSC's present value calculations used in connection with CPSC's injury estimation process. Rather than using a 3% discount rate, the OMB guidance

[21] *Id.* at 7 (citing OMB (2003) at 15).

states that a real discount rate of 7% should be used as a base case for regulatory analysis. *Id.* at 13-14 (citing OMB Circular A-94 and A-4 at 33). Dr. Morrall notes that while CPSC claimed that its choice of 3% was consistent with rates often used for choosing between alternative medical and public health interventions to determine the most cost-effective use of public resources, "the CPSC is not reallocating a fixed public health budget. It is allocating private sector capital toward public purposes. The CPSC is asking manufacturers to reallocate capital to change the products they produce in ways it thinks will improve the product. Thus the 7% discount rate should be used." *Id.*

Dr. Morrall also analyzes CPSC's acknowledged correlation in seatbelt use between driver and passengers. Specifically, he notes that the NPR "points out that the data show a strong association (0.82) between driver seatbelt use and passenger seatbelt use. CPSC states: "the implication that a correlation between seatbelt use by drivers and by passengers has for this analysis is that it indicates that the benefit of requiring the driver's seatbelt to be fastened were underestimated and the benefits of extending the requirement to include the right front passenger are over estimated." 79 Fed. Reg. at 69010.

While CPSC estimates that only 20% or $140 of the benefits would be attributable to the front seat passenger requirement, it does not calculate that 80% of these benefits would be attributed to the driver-side interlock requirement. Moreover, approximately 60% of the ROVs sold in Model Year 2015 already include a driver-side seatbelt speed-limiting interlock and CPSC staff and the ROV industry are meeting and discussing making the driver-side seatbelt speed-limiting interlock a requirement under a revised voluntary standard.

Dr. Morrall concludes that the NPR estimates would need to be adjusted to be consistent with OMB guidance and best practices. After applying the appropriate adjustment

factors under OMB guidelines and best practices, he concludes that there would be only $55 in lifetime benefits from the passenger-side speed limiting interlock per vehicle in 2017. Morrall Report at 17-18. He then notes that the NPR estimated quantifiable costs of extending the driver seatbelt interlock requirement to front seat passengers at $26 per vehicle ($7 for a seatbelt sensor, $13 for a seat weight switch and $4 for labor to install them per seat) adjusted for the 9% of vehicles that have more than one seat per front seat passengers. He questions the NPR's assumption[22] that there would be no additional research, design and development costs for adding the passenger interlock system:

> The assumption that there would be no additional research, development and design costs appears to be unrealistic since a multiple seat interlock system is considerably more complicated than a drivers only seat system. Moreover, to make the system effective, one needs a seat weight sensor so that the system can distinguish when passengers are or are not occupying the seats, which adds research design and development costs. Thus an equipment cost estimate for front passengers of $26 plus $12 = $38 seems like a more reasonable estimate than one without development validation costs.

Morrall Report at 18.

Finally, Dr. Morrall concludes that "[t]his equipment estimate is very close to the lifetime benefit estimate of $55 per vehicle" without even factoring in the various ongoing costs which the NPR admittedly did not quantify. *Id.* For example, CPSC did not quantify the costs to users

> who would prefer not to use seatbelts. The cost to these users would be the time required to buckle and unbuckle their seatbelts and any disutility cost, such as discomfort caused by wearing the seatbelt. We [the CPSC] cannot quantify these costs because we do not know how many ROV users choose not to wear their seatbelts. Nor do we have the ability to quantify any discomfort or disutility that ROV users would experience from wearing seatbelts.

[22] 79 Fed. Reg. at 69007.

Dr. Morrall relies on other studies, which have estimated the disutility of belting up and wearing seatbelts for on-road vehicles and adapted their findings to ROVs to provide a range of estimates of such disutility costs. 79 Fed. Reg. at 69006.

> Those studies [found] a range of annual disutility for seatbelt use of $371 to $1417 in 2012 dollars for on-road vehicles and 4 seconds per trip for the time needed to buckle up. Assuming ROVs are used only about 10% of the time compared to on- road vehicles, the ROV disutility index ranges from $45 to $150 per year per driver. However, further adjustment is needed to account just for front seat passengers who do not buckle. Front seat passengers are about 42% of the occupants of ROVS and [Dr. Morrall] assumed (following CPSC) that 80% would buckle up if the driver did and 20% would not.

Morrall Report at 19-20.

He notes that such costs occur each year over the assumed average life rather than just the first year, as CPSC did while CPSC calculated 18 years of benefits. He goes on to calculate that the additional disutility to passengers for the passenger interlocks ranges from $3.78 to $12.60 per year before applying the 7% discount rate for the present value. *Id.*

Finally, Dr. Morrall notes that the NPR discussed but did not estimate the ongoing costs for system failures for front passenger seatbelt interlocks, which increase with more complex systems.

> Failure in one or more of the components would impose some costs on the consumer, and this failure could possibly affect consumer acceptance of the requirement. For example, if the sensor in a passenger's seatbelt failed to detect that the seatbelt was latched, the speed of the vehicle could be limited, even though the seatbelts were fastened. The consumer would incur the costs of repairing the vehicle and the loss in utility because the speed was limited until the repairs were made.

79 Fed. Reg. at 69007 and Morrall Report at 21.

The NPR includes similar arguments in its discussion rejecting an extension of seatbelt interlock systems to rear seat passengers. 79 Fed. Reg. at 69007.

Accordingly, when "these previously unquantified ongoing cost estimates are added to

equipment costs, total costs range from about $100 to $190. The $55 lifetime benefit estimate falls far short of the lifetime cost estimates [without any adjustment] for any reduction in the benefit estimate because of disabling of the system. These calculations indicate that it is clearly important that the final regulatory analysis take into account ongoing costs as well as adjust benefits realistically for the way the world will likely look in 2017 and beyond." Morrall Report at 22. ROHVA endorses this analysis and conclusions by Dr. Morrall.

Moreover, the NPR explicitly recognizes that some drivers might disable the interlock system if it becomes annoying or breaks down, further reducing the safety benefits. The NPR identifies concerns about users buckling up packages on the passenger seat because the package weight might trigger the interlock, about passengers unbuckling and abruptly slowing the vehicle and about the possibility of a greater number of malfunctions for multi-seat devices. As the NPR states: "Some of these users could be motivated to defeat the requirement (and this could be done easily), which could reduce the benefits of the proposed rule." 79 Fed. Reg. at 69013. The National Highway Transportation Safety Administration (NHTSA) recently denied a petition by a leading automobile manufacture for permission to use an interlock system in exchange for increased flexibility in design. NHTSA found there was little evidence of consumer acceptance of mandated interlock systems and thus a strong possibility that consumers might disable them.[23] If drivers disable the interlock system, it certainly would reduce the safety benefits of the proposed passenger-side interlock requirement and, if the entire interlock system is disabled, reduce the safety benefits of the

[23] NHTSA explained: "This lack of acceptance among the types of occupants that an interlock is intended to target leads to the reasonable assumption that such occupants may attempt to disable the interlocks. This is supported by the research findings and the real world historical evidence of consumer backlash in the 1970s, which resulted in motorists finding ways to disconnect or circumvent their interlock system." 78 Fed. Reg. at 53389.

entire system.

D. Conclusions

Dr. Morrall concludes that the NPR:

> does not establish a need for the proposal, does not follow OMB recommended "best practices" in estimating benefits and costs, and does not fully analyze alternatives to the proposal. Benefits and costs for only the occupant protection provisions are estimated in the PRIA, and in any case the analysis is incomplete. The other provisions seem to be piggybacked onto the estimated benefits for the driver-side interlock requirement. . . [U]sing more reasonable assumptions and OMB's "best practices" methodology finds that the passenger-side seatbelt interlock provision has costs that significantly exceed its benefits and, perhaps more importantly, could under plausible conditions actually increase overall injuries and fatalities. My review suggests that before proceeding to a final rule the CPSC should provide more comprehensive regulatory analysis based on the best practices recommended in OMB guidance on regulatory analysis.

Morrall Report at 24.

ROHVA endorses Dr. Morrall's conclusions. It further notes that these conclusion make clear that CPSC has failed to provide substantial evidence to support the statutorily required finding that the expected benefits of the proposed passenger-side speed limiting seat belt interlock bear a reasonable relationship to its costs.

XIII. THE PROPOSED SHOULDER ZONE PASSIVE BARRIER CAN ALSO BE ACCOMPLISHED BY SINGLE-HAND, SINGLE-OPERATION BARRIER

CPSC proposes requiring a passive (fixed) barrier near the ROV occupants' shoulder and measured by a shoulder probe test. 79 Fed. Reg. at 68997. This proposal is perplexing because in August 2013, CPSC staff recommended that ROHVA's voluntary standards include *either* a passive (fixed) barrier *or* a single-hand, single-operation barrier. The following year the ANSI / ROHVA 1-2014 voluntary standards were revised to require a single-hand, single-operation

barrier. CPSC staff submitted no objections or other comments regarding that requirement in the voluntary standards process.

At the January 7, 2015 Public Comments hearing, rider groups testified in opposition to the proposed passive barrier. One stated reason was that a fixed barrier along the ROV's side would hinder larger-sized riders from entering and exiting the vehicle. Another was that a fixed barrier could be an obstacle to medical personnel helping riders in the event of an accident. For riders concerned about these issues, it is foreseeable that they would remove a fixed barrier, which obviously would be counter-productive.

Subsequent discussions with CPSC staff have helped clarify matters. ROHVA understands CPSC staff's concern to be with side-barriers that can be easily removed or rolled up. ROHVA submits that the single-hand, single-operation barrier addresses CPSC staff's concern, because it is attached to the vehicle (it cannot be rolled up or easily removed) and will help protect seatbelted occupants. In addition, the single-hand, single-operation barrier also addresses the concerns identified by enthusiasts worried about a narrowed opening to enter and exit ROVs.

XIV. EVEN IF THE MANDATES IN THE NPR WERE OTHERWISE SUPPORTABLE, CPSC'S PROPOSED EFFECTIVE DATES ARE UNREASONABLE AND ARBITRARY

CPSC proposes two compliance dates: (1) ROVs would be required to comply with the lateral stability and vehicle handling requirements 180 days after publication of a final rule in the Federal Register; and (2) ROVs would be required to comply with the occupant protection requirements 12 months after publication of a final rule in the Federal Register. 79 Fed. Reg. at 69018. These time periods and effective dates are wholly inadequate to comply with CPSC's proposed redesign of these vehicles.

A. Implementation Of Any Requirement Remains Uncertain

If it presses forward with the NPR despite the issues identified above, CPSC's proposed requirements will remain uncertain until *after* the publication of the final notice of rulemaking. ROV manufacturers simply cannot know which of CPSC's ideas will or will not survive the rulemaking process. This will necessarily delay any required design changes, testing, and validation of such changes, and myriad other steps that must be taken before introducing a compliant ROV model into the marketplace. The short timeframes proposed in the NPR are inadequate for this kind of process for such complex vehicles.

B. Vehicles Are Designed And Manufactured In Advance By Model Year, Not Monthly Intervals

Further, imposing requirements based on months – and not Model Years – is not workable in light of how vehicles are manufactured. ROV manufacturers currently are working to meet the new voluntary standards requirements set forth in ANSI / ROHVA 1-2014, which is in force for Model Year 2017. Similarly, the vehicles currently being manufactured are categorized as Model Year 2016 for delivery to consumers in 2015. Thus, measuring time in months based on an unknown triggering date based on publication of the final rule is impractical and inappropriate given how these vehicles actually are designed and manufactured.

C. Implementation Takes Longer Than CPSC Proposes

Industry experience with its own research and development to engineer, prototype, tool, and validate a vehicle design change typically takes two model years to implement. In other words, 20-24 months. Thus, a design approved in calendar year 2015 would not appear on vehicles until calendar year 2017 (Model Year 2018).

If a final rule were published prior to June 2016, then the changes would be implemented in Model Year 2018. And publication between June 2016 and June 2017 would mean implementation in Model Year 2019. This process can be briefly summarized:

- Once the specifications are known, including any compliance requirements, a prototype is built and tested. It can take numerous attempts to find a promising acceptable configuration, and even when found the work is far from over.
- Next the parts are procured from suppliers. (The parts used for the first prototypes are generally "home-made" machined parts.) The proposals in the NPR involve parts from multiple suppliers and must be coordinated to obtain them at the same time – and thus be ready for installation on a later prototype.
- Then the parts are fitted for duty. An ROV cannot pass a certification test, and then degrade after the first hours of use. Reliability is necessary to avoid downside consequences of non-compliant or safety-related defect. Although some laboratory testing can accelerate some testing, test drivers must drive thousands of miles in various terrain conditions.
- Next there is an engineering release a few months before the start of production, which is the time necessary to ready the production line and suppliers.
- Finally all of these tasks must be completed for each model and platform. And any affected safety-relating warnings and instructions must be revised and published to accurately describe the new features in the various Owners' Manuals and other technical publications.

D. CPSC's Proposed Modifications Are Significant, Expensive, and Will Require Extensive Testing

CPSC understates the effort required to implement the kind of design and performance mandates in the NPR. In support of the proposed Lateral Stability and Vehicle Handling Requirements, CPSC relies exclusively on the Yamaha Rhino voluntary repair program in suggesting that all ROVs can be easily modified to meet new requirements. Apart from other flaws in its analysis of that matter[24], it is unrealistic for CPSC staff to assume that the modifications involved in the Rhino voluntary repair program will satisfy CPSC's new requirements for *all* ROVs without regard to the vehicles' differing designs, dimensions, dynamics, and other factors. For example, it may be necessary to add a front sway bar to some ROVs, which in turn would require modifications to the frame and suspension A-arms. Nowhere in the NPR are these kind of fundamental vehicle differences discussed, much less analyzed, for purposes of determining a plausible effective date for the NPR's industry-wide mandates.

Further, given that CPSC cannot direct manufacturers to use a specific means/technology to meet requirements, ROV manufacturers must be permitted to test, try, and ultimately choose different technological paths. This is particularly true in the context of ROVs, which must be able to perform in a safe and capable manner (for example, path following) across a variety of terrain and loading conditions.

If this rulemaking proceeds, CPSC must provide ROV manufacturers additional time to implement any requirements that survive, consistent with the development and manufacture of vehicles per model year cycles, reflective of the time actually spent designing and implementing changes to the vehicles, and in order to avoid unintended consequences to vehicles used across a variety of terrain. At a minimum, if the final rule is published prior to June 2016, then

[24] *See* Comments submitted by Yamaha Motor Corporation.

implementation should be in Model Year 2018; and if published between June 2016 and June 2017, then implementation should be in Model Year 2019.

XV. CONGRESS HAS INTRODUCED BI-PARTISAN LEGISLATION TO REVIEW THE NPR

ROHVA and ROV enthusiasts are not the only ones concerned with the NPR. The U.S. Senate and House of Representatives have introduced bi-partisan legislation known as the ROV In-Depth Examination Act (S. 1040 and H.R. 999) requiring that the NPR be examined by other federal agencies, including the National Academy of Sciences, in consultation with the National Highway Traffic Safety Administration and the Department of Defense. This common-sense approach – resolving technical issues *before* considering implementation – should be supported by all stakeholders. Additionally, bi-partisan members Congress have sent written correspondence to CPSC encouraging resolution through the voluntary standards process.

XVI. RECENT DISCUSSIONS BETWEEN CPSC AND INDUSTRY REGARDING THE VOLUNTARY STANDARDS HAVE BEEN PRODUCTIVE AND SHOULD BE PERMITTED TO CONTINUE

ROHVA has formally opened the voluntary standards by submitting the PINS Standard Action Request Form to ANSI. That means the requirements in ANSI / ROHVA 1-2014 can be revised, providing an alternate formal context for CPSC staff and ROHVA to continue their discussions. There already is apparent agreement that a requirement for a driver-side seatbelt speed-limiter should be added to ROVs with electronic throttle control, and there appears to be potential for agreement for how to use and measure divergent instability as a better metric for vehicle handling. It is difficult to see how a passenger-side seatbelt speed-limiter makes sense in light of the technical difficulties that have been identified, the potential for loss of driver control of the vehicle, the fact that its costs significantly exceed its benefits, and the clear opposition of both operators and passengers reflected in the Westat Phase 2 Report. That leaves a few matters

to discuss, and the talks have been fruitful enough to reasonably conclude that consensus can be reached there, too. ROHVA remains committed to those discussions.

XVII. CONCLUSION

For the reasons shown above and in the other accompanying comments from ROHVA members and others, there are numerous significant flaws in the NPR, including incomplete and erroneous data collection and analysis, misapplication of on-highway vehicle dynamic principles to off-highway vehicles, and unsound, unproven mandates that could adversely affect ROVs and pose significant safety concerns to the millions of ROV enthusiasts. ROHVA respectfully urges CPSC to reject the NPR, suspend any further mandatory rulemaking, and continue to work cooperatively with ROHVA on consensus voluntary standards. Continuation of the voluntary standards process can accomplish our shared goal of promoting ROV safety far more effectively and efficiently than mandatory rulemaking.

Respectfully submitted,

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