



RECREATIONAL  
OFF-HIGHWAY  
VEHICLE  
ASSOCIATION

February 9, 2010

**VIA ELECTRONIC MAIL AND REGULAR MAIL**

Mark Kumagai  
Director, Division of Mechanical Engineering  
U.S. Consumer Product Safety Commission  
4330 East-West Highway  
Bethesda, MD 20814

Re: Recreational Off-Highway Vehicle Testing

Dear Mr. Kumagai:

On behalf of the Recreational Off-Highway Vehicle Association (ROHVA) and its member companies, I am writing to express concerns over the CPSC's apparent approach to ROV testing and to invite CPSC to work with ROHVA and its members to develop accurate, feasible and cost effective procedures for gathering and analyzing data relative to ROV vehicle dynamics.

We understand that CPSC has contracted with the Aberdeen Test Center ("ATC") to develop testing protocol for ROVs and to design and assemble an instrumentation package that will allow "CPSC staff to evaluate ATV and ROV stability and handling characteristics." According to recently published Statements of Work, the objectives of these contracts are to:

- "gain a better understanding of the stability characteristics of ROVs and adult ATVs while providing a baseline against which to compare the stability performance of different brands and models";
- "evaluate the ROVs and ATVs lateral stability characteristics";
- "determine if there are characteristics of certain models which make them more stable and/or less incident prone than other models"; and
- "design and assembl[e] an instrumentation package unique to ATV and ROV testing that is user friendly, easily transferable, and capable of recording the standard measurements used in vehicle dynamics analysis." Specifically, the instrumentation package must be designed to transmit data wirelessly and measure and record the following: vehicle speed; vehicle acceleration in 3 axes; vehicle roll (angular rate) in 3 axes; vehicle steer angle; displacement at each wheel and shock; force application at throttle; and brake and brake stopping distance.

In addition, the CPSC has disclosed an intent to contract with SEA Limited to provide ROV vehicle measurements for center of gravity; roll, pitch and yaw moments of inertia; weight distribution at each tire; static tests and dynamic tests.

ROHVA members have collectively spent millions of dollars and many years developing and executing internal test programs on their respective vehicles addressing the various factors set forth in the CPSC Statements of Work and many more. This development effort is required to ensure the accuracy of results and to make sure the test results can be relied upon as a predictor of vehicle behavior in the wide range of conditions in which ROVs operate. Further, because of the unique mobility requirements of ROVs, the variety of ROV applications (e.g., work, recreation, military) and resulting designs and the numerous terrains upon which they are designed to operate, the test programs are very complex and comprehensive because they must take into account a wide array of static and dynamic attributes as well as different suspension, driveline and tire effects. These complexities also necessarily mean that one test cannot be relied upon to predict vehicle performance but rather must be evaluated along with a number of tests that reflect vehicle performance consistent with expected customer usage.

It is with this background that ROHVA is writing to express its concern regarding the scope, parameters and development methods set forth in the Statements of Work associated with CPSC's test and instrumentation proposals for ROVs. ROHVA believes that the test program and instrumentation proposals will likely give overly narrow and/or misleading results and cause adverse unintended safety consequences if relied upon as a predictor of ROV handling and dynamics.

Specifically, ROHVA notes that the Statements of Work do not include basic test methodology requirements as related to specifications for the instrumentation package or data-acquisition ("DA") system. These should include physical specifications such as size and weight of the DA, as well as specifications related to data measurement, such as resolution, sample rate, filter characteristics, sensor and system accuracy. Although the Statements of Work set forth certain parameters to be measured, they fail to include other parameters such as vehicle slip angle, angular wheel velocity, heading and path angles, and engine RPM, for example, all of which are of vital importance to a full analysis of vehicle stability and other dynamics. Because of these omissions, data generated by these tests and any conclusions drawn therefrom will not be a reliable or sufficiently comprehensive predictor of vehicle performance. ROHVA is also concerned, based upon the experience of its own members, that the funds allocated for these projects are woefully inadequate given the complex and difficult nature of capturing relevant, accurate data.

ROHVA likewise is concerned about ATC's ability to design and assemble a DA that can provide accurate information relevant to the analysis of ROV vehicle dynamics. ROHVA understands that ATC is primarily familiar with large and heavy military vehicles, where the weight and physical size of DA systems are not critical. The vehicle characteristics and stability

dynamics of lighter-weight ROVs are quite different, and they are far more likely to be adversely affected by the weight and other loads associated with an on-board DA system. Moreover, the CPSC specification raises serious questions about the type of DA system it intends to use in testing ROVs and ATVs. The CPSC appears to be focused on a large, heavy automobile-type DA system which can be simply transferred from vehicle to vehicle. The size, weight and placement of the external hardware (outriggers, mounting hardware, brackets, transducers, etc.) necessary to operate this type of DA system can significantly impact the steering and handling characteristics of the vehicle being tested. This impact would be disproportionately greater on off-highway vehicles like ROVs and ATVs because they are significantly lighter than automobiles. Test results produced from installed test equipment that is disproportionately large or heavy are likely to be less reliable and accurate.

In addition, requiring wireless data transmission is both unnecessary and more costly. The data can be recorded on-vehicle and simply downloaded after each test for greater reliability (particularly in off-highway test environments) and lower cost.

Finally, ROHVA is concerned about the CPSC's intended use of the DA system and its ability to accurately interpret and analyze any resulting data. The Statements of Work note that the DA system must be "user-friendly" for "CPSC staff to evaluate ATV and ROV stability and handling characteristics." At the same time, ROHVA members know from their own experience that calculating roll, pitch, and yaw angles, velocities, and accelerations on off-highway vehicles is very difficult, time-consuming work in a normal context requiring significant effort by trained and experienced personnel, and monies directed at quality control. The complexity involved in ensuring accurate data and the appropriate analysis of such data to reach sound conclusions does not lend itself to a user-friendly, simple process. That's why ROHVA members have testing organizations with sophisticated measurement equipment and comprehensive field testing programs in addition to being staffed with engineers who have extensive experience in vehicle testing, handling and dynamics. The Statements of Work suggest CPSC believes there is a simple way to test and analyze the test data to reach conclusions about vehicle performance using personnel with little vehicle dynamics testing experience. ROHVA members know through years of on-the-ground experience that this approach will lead to unreliable data and faulty analysis.

Further, nothing in the Statements of Work suggests that the CPSC intends to do any of the proposed testing on off-highway surfaces, where ROVs are designed and intended to be operated. There is also nothing in the Statements of Work which suggests that the CPSC intends to consider or analyze the difference between on-highway and off-highway tire dynamics that relate to vehicle stability if its testing is done on-highway. Lastly, if its testing is done on-highway, there is nothing that suggests the CPSC intends to consider the difference in desired steering characteristics of vehicles on on-highway and off-highway terrains in its attempt to evaluate ROV stability and handling characteristics.

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For all these reasons, ROHVA invites the CPSC to work with ROHVA to develop accurate, feasible and cost effective procedures for gathering and analyzing data relative to ROV vehicle dynamics. ROHVA members have in the past provided information and data relating to their vehicles and explained the processes and equipment used to gather that data. They are willing to continue to do so and invite the CPSC to continue its dialogue with the industry. Absent this dialogue, ROHVA believes that the instrumentation package and testing proposed and contracted for by the CPSC are likely to produce incomplete, distorted and inaccurate data that will result in adverse unintended safety consequences if relied upon as a predictor of ROV vehicle performance.

Very truly yours,

A handwritten signature in dark ink, appearing to read "Paul C. Vitrano". The signature is stylized with a large initial "P" and a prominent "V".

Paul C. Vitrano  
Executive Vice President and General Counsel