

LOG OF MEETING DIRECTORATE FOR ENGINEERING SCIENCES

SUBJECT: Recreational Off-Highway Vehicles (ROVs) – Meeting requested by the Recreational Off-Highway Vehicle Association (ROHVA) to discuss their progress in developing voluntary standard requirements that address occupant protection and vehicle stability.

DATE OF MEETING: December 15, 2010

PLACE OF MEETING: U.S. Consumer Product Safety Commission, Bethesda, MD

LOG ENTRY SOURCE: Caroleene Paul, ESME *CP*

COMMISSION ATTENDEES: See attached attendance list

NON-COMMISSION ATTENDEES: See attached attendance list

SUMMARY OF MEETING:

Representatives of the Recreational Off-Highway Vehicle Association (ROHVA) met with CPSC staff to discuss ROHVA's progress in developing voluntary standard requirements that address occupant protection and vehicle stability.

CPSC staff opened the meeting by setting the following ground rules:

- ROHVA requested this meeting with CPSC staff so, although the meeting was public, discussions were limited to ROHVA representatives and CPSC staff/representatives.
- The opinions or views expressed by CPSC staff were not reviewed or approved by the Commission and may not reflect the views of the Commission.
- The discussions during the meeting will be treated as comments to the ongoing rulemaking and will become part of the public record.

ROHVA representatives presented an overview of their approach to addressing occupant protection in ROVs, their position on static and dynamic vehicle testing as it applies to ROVs, and revisions they have made to labeling requirements. Presentations were made by ROHVA, Dynamic Research Inc. (DRI), and Applied Safety and Ergonomics Inc. (see attached presentation).

The following points were made regarding occupant protection:

- The voluntary standard will introduce four Zones of protection with design and/or performance requirements:
 - Zone 1 – Leg/Foot area will require a 4 inch high (from the floor) barrier that must withstand a 50 lbf outward force and have no opening greater than 3 inches in diameter.
 - Zone 2 – Shoulder/Hip area will require a barrier that withstands a 100 lbf outward force or the ROV shall pass a 45 degree tilt of the vehicle with a seat

belted test dummy where the torso of the dummy does not extend more than 5 inches beyond the vehicle width.

- Zone 3 – Arm/Hand area will require a barrier that withstands a 50 lbf outward force and have no opening greater than 3 inches or the ROV shall pass a 45 degree tilt of the vehicle with a seat belted test dummy where the arm/hand of the dummy does not extend more than 7 inches beyond the vehicle width.
- Zone 4 – Head area will require mandatory helmet use.
- Seat Belts – the standard will require a minimum 3-point restraint for all seats and mandatory restraint warning light that illuminates for at least 8 seconds.
- CPSC staff asked what tests, studies, or research were used to develop the design and performance requirements for each of the zones; and that the research be made available to staff.
- CPSC staff stated that it appears that ROHVA's requirement for mandatory helmet use will address interior head impact but not crushing of the head by the vehicle. Staff asked if ROHVA has determined if a helmet can withstand crushing by a typical ROV. ROHVA replied that they did not know.
- CPSC staff asked how ROHVA intended to make helmet use mandatory. ROHVA indicated that all manufacturers will prominently recommend helmet use.

The following points were made regarding static and dynamic testing of ROVs:

- In response to CPSC staff's comments on the canvass drafts of the voluntary standard, ROHVA added more rigorous tilt table requirements. The required lateral tilt angle for an ROV with 2 occupants was increased to a 30 degree angle (from 28 degrees).
- DRI reviewed the rollover resistance test (RRR) that they developed to evaluate ROV dynamic stability. The test is a constant steering wheel angle test where the steering wheel of the test vehicle is locked at a 25 ft radius circle and accelerated until 2-wheel lift occurs or 2-wheel spin/spiral in occurs. The tests are conducted on asphalt.
- A vehicle passes the RRR if 0.6g of lateral acceleration is achieved without 2-wheel lift or the vehicle becomes speed limited. A vehicle fails the RRR if 2-wheel lift occurs below 0.6g of lateral acceleration. A vehicle must pass 8 of 10 runs (5 in clockwise and 5 in counterclockwise directions) for the vehicle to pass.
- DRI believes 0.6g is greater than the average off-highway tire/soil lateral force coefficient of off-highway surfaces.
- DRI presented test data of 6 vehicles that were tested to show that 2-wheel lift occurred for both oversteer and understeer vehicles. DRI maintains that oversteer/understeer is dependent on the test surface and that asphalt results do not equal off-highway results.
- CPSC staff asked how the 0.6g value was developed. DRI responded that it was based on measurements that were taken in the 1980s of 20 ATV riding areas. Staff asked if these riding areas were similar to terrain where actual ROV incidents have occurred, such as grassy fields. DRI responded that they would have to look at that.
- CPSC staff and DRI discussed rollover thresholds, tripped versus untripped rollovers, and the significance of understeer and oversteer characteristics of the vehicle. DRI did not agree with CPSC staff statements that oversteer is an undesirable characteristic due to lateral acceleration gain and vehicle slide that can

lead to tripped rollovers (berms from dirt build-up or ruts or any number of other off-road terrain features).

- CPSC staff asked if all the vehicles ROHVA tested passed the RRR test. ROHVA replied that all passed. CPSC staff asked if any ROVs on the market would fail the RRR test. DRI declined to reply.
- CPSC staff asked if more test data to support ROHVA's proposals will be received when the ballot for revisions to the voluntary standard is sent to canvass members. ROHVA replied yes.

The following points were made regarding ROV labeling requirements:

- Applied Safety and Ergonomics gave a presentation on labeling requirements and development work they did to revise the labeling requirements for ROVs. Their effort included ROV accident analysis and analysis of driver behavior during focus groups where drivers completed a closed loop driving course.
- CPSC staff asked for a copy of the full report on the focus group work.

ROHVA reviewed the progress of an ROV E-course that is available online. A hands-on course is under development and estimated to be completed by the end of the summer.

ROHVA summarized that over the course of two years of meetings and exchanges with CPSC staff, ROHVA has tried to meet CPSC's challenges. ROHVA believes they have achieved this through their efforts with training, labeling, dynamic testing, and occupant protection testing.

MEETING ATTENDANCE RECORD
ROHVA / CPSC Staff – December 15, 2010

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