AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES
	1 | 9

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
0001	See Block 16C	REQ-4400-10-0057	22638

6. ISSUED BY	CODE	7. ADMINISTERED BY *(If other than Item 6)*	CODE
CONSUMER PRODUCT SAFETY COMMISSION DIV OF PROCUREMENT SERVICES 4330 EAST WEST HWY ROOM 517 BETHESDA MD 20814	FMPS	CONSUMER PRODUCT SAFETY COMMISSION DIV OF PROCUREMENT SERVICES 4330 EAST WEST HWY ROOM 517 BETHESDA MD 20814	FMPS

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and ZIP Code)*		
ACTIVE SAFETY ENGINEERING 17727 TIMBER LANE MARYSVILLE OH 43040-9017	(x)	9A. AMENDMENT OF SOLICITATION NO.
		9B. DATED *(SEE ITEM 11)*
	X	10A. MODIFICATION OF CONTRACT/ORDER NO. CPSC-S-10-0034
		10B. DATED *(SEE ITEM 13)* 04/28/2010
CODE [redacted]	FACILITY CODE	

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☐ is not extended.
Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)* Net Increase: $76,800.00
0100A10DPS-2010-2263800000-EXHR004400-255C0

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	
	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
X	D. OTHER *(Specify type of modification and authority)* UNILATERAL MODIFCATION, FAR 43.103 (b)

E. IMPORTANT: Contractor ☒ is not, ☐ is required to sign this document and return 0 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

DUNS Number: [redacted]

Contract modification 0001 is hereby issued to add the exploratory tests on sample ROVs in accordance with the attached statement of work (SOW) seven (7) pages and supplier technical proposal (option 1).

As a result of the above, the total contract amount is increased by $76,800 from $36,300 to $113,100.

All other terms and conditions remain unchanged and in full effect.

Add Item 0002 as follows:
Continued ...

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*		16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*	
		Rudy M. Johnson	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
(Signature of person authorized to sign)		*(Signature of Contracting Officer)* Rudy M Johnson	8/18/2010

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Previous edition unusable

STANDARD FORM 30 (REV. 10-83)
Prescribed by GSA
FAR (48 CFR) 53.243

Todd Stevenson

RJ

NAME OF OFFEROR OR CONTRACTOR
ACTIVE SAFETY ENGINEERING

ITEM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
0002	Contractor to perform additional exploratory tests on sample ROVs.	1	EA	76,800.00	76,800.00

Modification 1
Statement of Work
Pilot Study - Test and Evaluation of Occupant Protection
For Recreational Off-Highway Vehicles (ROV)

A. Contract Type- This is a firm fixed priced type contract for the services described herein.

B. Background

Recreational off-highway vehicles (ROVs) are motorized vehicles having four or more low pressure tires designed for off-road use and intended by the manufacturer primarily for recreational use by one or more persons. ROVs are distinguished by having a steering wheel for steering control, foot controls for throttle and braking, bench or bucket seats for side-by-side seating, rollover protective structure (ROPS) and restraint system for occupant protection, and a maximum speed greater than 30 mph. ROV's are designed with a shorter wheel-base and a narrower track width than highway vehicles to enable traverse on narrow off-road trails where all terrain vehicles (ATVs) are also used. Both of these features, and a high system center of gravity, result in low static stability factors (SSF) that are less than normal passenger vehicles resulting in poor stability and control characteristics relative to highway vehicles and a higher risk of rollover crashes. In addition, the vehicles are designed with open compartment configuration and different seating heights, that give great versatility, but increases the likelihood of complete and partial ejections, and contact with surrounding objects in the event of a rollover or crash event. An obvious protection concept is to improve occupant containment and retention of occupants within the confines of the ROV. In a rollover event, which is the most common type of crash event that produces serious injuries, any part of the occupant body that traverses outside of the protective periphery of the vehicle, is likely to receive injuries from contacts with the ground or the vehicle or obstacles outside the vehicle.

Considering past work by the National Highway Traffic Safety Administration (NHTSA) is a logical starting point in an effort to address occupant containment within an ROV during a rollover event. As such, the contractor shall be knowledgeable with NHTSA's approach to occupant protection test methods. The contractor shall be familiar with Federal Motor Vehicle Safety Standards (FMVSS) that may relate to ROV rollover.

In considering approaches which might improve the containment of ROV occupants, a variety of test approaches are being considered and evaluated. Among these test approaches are: 1) A simple quasi-static rollover platform test (as specified in FMVSS 301 *Fuel System Integrity*), and 2) One or more dynamic rollover test approaches. It is believed that the most simple test approach that is repeatable and that adequately reproduces occupant excursions outside of the vehicle is the most desirable. This test approach will be developed and used to evaluate the effectiveness of occupant protection in existing ROVs.

C. Objective

The objective of the pilot study is to obtain quick-look data to assess the suitability of different test procedures and vehicle response comparisons in evaluating occupant retention and protection in the event of a rollover in an ROV. In particular, the objective of the test program is to investigate alternative methods of simulating ROV rollover events and to identify the best way to assess the ejection potential and occupant safety of ROV's. Two sample ROVs with significant differences in occupant retention and protection design will be provided for evaluation. The results of this study shall provide a basis for the study of a larger segment of the existing ROV models available in the market.

D. Work

1. Vehicle Documentation and Preparation

The contractor shall document the condition of the test vehicles and will note any damage or anomalies that could affect test results.

2. FMVSS 301 Rollover Platform Test

   a. The contractor shall simulate rollover of an ROV by utilizing a quasi-static rollover platform test procedure used in FMVSS 301 (that is used to check for fuel leakage following a collision). The test apparatus consists of a platform attached to pivots at each end that is motorized to rotate the platform through 360 degrees of rotation. Whereas the FMVSS 301 protocol requires rotating a vehicle in 90 degree increments to assess fuel leakage, the ROV occupant retention test protocol would assess occupant excursion outside the vehicle's protective periphery.

   b. The contractor shall drain the fluids and remove the battery from the vehicle before conducting the test. Tire pressure is not critical but the steer angle of the vehicle will be set straight ahead.

   c. The contractor shall use a ballast dummy (without instrumentation) in each seating location in the vehicle for each test. Tests shall be conducted with a 5^{th} percentile female dummy and with a 50^{th} percentile male dummy in each test configuration. The dummy limb friction settings will be adjusted to allow easy movement. The contractor shall establish a seating procedure for placement of the dummy in the vehicle. The procedure must allow for consistent placement of the dummy for the duration of the program and in subsequent test programs.

   d. The contractor shall conduct rollover tests on the platform with the length of the vehicle oriented parallel to the longitudinal axis of the platform (90 degree lateral testing) and with the vehicle oriented 30 degrees to the longitudinal axis of the

platform (60 degree lateral testing). The purpose of the 90 degree lateral test is to simulate pure lateral motion. The purpose of the 60 degree off-lateral testing is to introduce a forward component of force.

e. The contractor shall rotate the platform continuously through 360 degrees of motion at an optimum rate to be determined by the contractor. The contractor shall document excursion of the 5th percentile female and 50th percentile male dummies. The contractor shall perform enough trials to determine the repeatability of the test results.

3. HYGE Sled Rollover Test

a. The contractor shall simulate a dynamic rollover of an ROV by utilizing a HYGE accelerator sled. The HYGE accelerator sled is commonly used to simulate frontal, side, and rear crashes. It allows the vehicle to experience the accelerations of a crash event without actually crashing and thus preventing damage to the vehicle structure. The HYGE is a highly repeatable energy source so it is anticipated that the resulting dummy excursions and accelerations will also be repeatable.

b. For the ROV sled test protocol, the ROV shall be positioned laterally on the inclined platform in front of the propulsion device. The downhill tires/wheels shall be restrained by a raised lip on the platform. When the propulsion is activated, the platform begins to move out from under the ROV, initiating a roll motion. The ROV shall be restrained by tethers to limit the roll motion to less than ½ turn, which would expose the dummies to rapid rolling motion, and allow dummy excursions to be filmed and analyzed, and the dummy accelerations to be recorded.

c. The contractor shall fabricate a sled platform for mounting the vehicle at 90 and 60 degree alignment with the sled propulsion system. The contractor shall use a ballast dummy (without instrumentation) in each seating location in the vehicle for each test. Tests shall be conducted with a 5th percentile female dummy and with a 50th percentile male dummy in each test configuration. The dummy limb friction settings shall be adjusted to allow easy movement. The contractor shall use the same dummy seating procedure developed for the roll-platform tests.

d. The contractor shall perform the sled tests with a dummy in each seating position of the vehicle. The excursions shall be documented by analyzing high speed photography of the dummy responses in each test.

3.1 Rollover Simulator Sled Test (Modification 1)

a. The contractor shall simulate a dynamic rollover of an ROV by utilizing a rollover simulator sled. The rollover simulator sled is commonly used to simulate rollover events for the evaluation of occupant protection features in passenger cars. The

simulator creates the rollover event by accelerating the sled or decelerating the sled with the vehicle mounted in various attitudes on the sled. The simulator has the option of subjecting the mounted vehicle to sustained accelerations in either the positive or negative direction. The simulator can also reproduce complex acceleration profiles. The simulator is highly repeatable and is expected to produce repeatable dummy excursions for analysis.

b. For the ROV sled test protocol, the ROV shall be positioned laterally on the platform in front of the propulsion device. The downhill tires/wheels shall be restrained by some means on the platform. When the propulsion is activated, the sled will expose the vehicle to a sustained deceleration, initiating a roll motion. The ROV shall be restrained by tethers to limit the roll motion to less than 90 degrees, which will expose the dummies to rolling motion, and allow dummy excursions to be filmed and analyzed, and the dummy accelerations to be recorded.

c. The contractor shall fabricate a sled platform for mounting the vehicle at 90, 60, and 45 degree alignment with the sled propulsion system. The contractor shall use a 50^{th} percentile EuroSID male dummy with instrumented head. Tests shall be conducted with the dummy in the tip side seating location of the vehicle. The contractor shall use the same dummy seating procedure developed for the roll-platform tests.

d. The contractor shall conduct tests at input accelerations consistent with the lateral rollover threshold of the vehicle (around .6g's) and at higher accelerations of 1g and 2g for comparison to results from the first phase of the special study.

e. The contractor shall conduct some tests with an unbelted dummy to assess the performance of passive restraints. In particular, the contractor shall assess the performance of a torso bar in restraining the dummy when forward momentum is introduced during a 60 degree and 45 degree angled rollover.

f. The excursions shall be documented by analyzing high speed photography of the dummy responses in each test. Head accelerations shall be documented as well.

4. Analysis

The contractor shall perform the following:

- Comparison of the static test excursions with the dynarnic test excursions
- Comparison of the 60 and 90 degree excursion results
- Analysis of the repeatability of the static and sled-induced dynamic rollovers

5. Enhanced Restraint Test

Following the previous testing and analysis, the contractor shall determine which static and dynamic tests are appropriate to evaluate an improved occupant protection system. The occupant retention/protection system of the worst performing vehicle shall be improved by improving the seat belt system and/or the addition of passive restraints. The contractor shall perform the static and dynamic tests with a 5^{th} percentile female dummy and a 50^{th} percentile male dummy. The dummy limb friction settings shall be adjusted to allow easy movement and the same dummy seating procedure developed for the roll-platform tests shall be used.

6. Report

Following the completion of all testing, including the enhanced restraint testing, a final report shall be written. The report shall include the following:

- comparative analysis of the effectiveness of each test configuration
- comparative analysis of the test methods
- observations concerning the occupant retention and protection system of the ROVs
- comparative analysis of the excursion of a 5^{th} percentile female dummy versus a 50^{th} percentile male dummy
- analysis of the repeatability of static and sled-induced dynamic rollovers
- analysis of the enhanced restraint system test
- comparison of NHTSA's approach and strategy to occupant protection and application thereof to ROVs
- recommendation for test protocol for full-scale testing of sample ROVs to evaluate occupant protection performance of the vehicles in the event of a rollover

6.1 Follow-up study report (Modification 1)

Following the completion of the second phase of the pilot study, a final report shall be written. The report shall include the following:

- comparative analysis of the effectiveness of each test configuration
- comparative analysis of the test methods (sled tests, lateral acceleration profiles, unbelted versus belted dummies)
- analysis of the repeatability of sled-induced dynamic rollovers
- analysis of the performance of the passive restraint system under different test conditions
- recommendation for test protocol for full-scale testing of sample ROVs to evaluate occupant protection performance of the vehicles in the event of a rollover

E. Minimum Technical Requirements:

E.1. Analysis

1.1 High speed photography capable of capturing/documenting rotation angle and limb/head/torso excursion of dummies from vehicle at various angles.

1.2 Front, rear, side, and plane views of dummy excursions when applicable.

1.3 Clear markings on dummy's head CG, sternum, arms, and legs for future video analysis with specialized software such as ProAnalyst.

E. 2. Static Test:

2.1. The rollover platform fixture shall accommodate an ROV, shall be motorized, and shall rotate the platform through 360 degrees of rotation. The platform cross-members shall be adjustable to align with the wheel base of each ROV. The platform shall also allow positioning of the vehicle with its length oriented 30 degrees to the longitudinal axis of the platform.

E. 3. Dynamic Test: (Modification 1)

3.1. HYGE sled and the roll simulator shall be repeatable within +/- 2%.

3.2. The HYGE sled and the rollover simulator shall allow mounting of an ROV at 90 degree, 60 degree, and 45 degree alignment with the sled propulsion system. The platform shall be capable of holding the ROV at an initial roll angle of 10-20 degrees and shall have a restraining means to interact with the ROV's forward tires/wheels to provide the roll initiating force. The sled platform will also contain tethers to restrain the ROV to prevent it from rolling over completely.

F. Load Conditions

1. A 50^{th} percentile male dummy in the driver and passenger seats.
2. A 5^{th} percentile female dummy in enough configurations to determine preliminary differences between the excursions of a 5^{th} percentile female and 50^{th} percentile male dummy.

F.1 Load Conditions (Modification 1)

1. 50^{th} percentile EuroSID male dummy in the tip side seating location of the vehicle.

G. Vehicles To Be Evaluated

Vehicles will be supplied.

1. Yamaha Rhino
2. Polaris RZR, or other vehicle as specified.

H. Vehicle Test Schedule And Shipment (all dates are estimates and subject to change)

1. The CPSC supplied vehicles shall be located at the Transportation Research Facility (TRC) in East Liberty, OH and will be available for the pilot study between April 30, 2010 and June 4, 2010.
2. The contractor shall be responsible for pick-up and drop-off of the vehicles from the TRC facility.
3. The contractor may perform the static and dynamic tests at the TRC facility. If the contractor does not perform the tests at the TRC facility, the contractor shall be responsible for shipment of the vehicles to and from the chosen test facility.
4. The contractor shall provide a final report by June 14, 2010.

H1. Vehicle Test Schedule and Shipment (Modification 1)

1. The CPSC supplied vehicles will be located at SEA, Ltd. (7349 Worthington-Galena Rd., Columbus, OH 43085).
2. The contractor shall be responsible for pick-up of the vehicles from SEA and delivery of the vehicles to the test facility.
3. After completion of the test effort, the contractor shall be responsible for shipment of the vehicles to the CPSC laboratory facility (10901 Darnestown Rd., Gaithersburg, MD 20878.
4. The test schedule shall be extended to accommodate testing added by Modification 1.