AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES
	1 2

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
0003	06/23/2010	REQ-4400-10-0048	

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)

SEA LTD
7349 WORTHINGTON-GALENA RD
COLUMBUS OH 43085-1519

CODE [redacted] FACILITY CODE

(x) 9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

x 10A. MODIFICATION OF CONTRACT/ORDER NO. CPSC-S-10-0014

10B. DATED (SEE ITEM 13) 02/23/2010

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: $77,378.00
0100A10DPS-2010-2263800000-EXHR004400-252B0

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) BILATERAL MODIFCATION, FAR 43.103 (a)

E. IMPORTANT: Contractor is not, x is required to sign this document and return 1 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]
Modification 0003 is hereby issued to contract CPSC-S-10-0014 to add three additional recreational off-highway vehicles in accordance with the contractor quotation attached (dated May 18, 2010).

The total amount of this purchase order is herby increased by $77,378 from $170,591.00 to $247,969.00

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED AND IN FULL EFFECT.

Add Item 0004 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)
GARY J. HEYDINGER DIRECTOR VEHICLE DYNAMICS DIVISION	Rudi M. Johnson

15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
Gary J. Heydinger (Signature of person authorized to sign)	6/24/10	Rudi M. Johnson (Signature of contracting officer)	6/25/10

NSN 7540-01-152-8070
Previous edition unusable

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

Todd Stevenson

CONTINUATION SHEET	REFERENCE NO. OF DOCUMENT BEING CONTINUED CPSC-S-10-0014/0003	PAGE 2 OF 2

NAME OF OFFEROR OR CONTRACTOR
SEA LTD

ITEM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
0004	Add testing of three addtional vehicles to the existing contract.	1	EA	77,378.00	77,378.00

Modification for Contract: CPSC-S-10-0014 Three Additional Vehicles to be Tested: Vehicle Characteristics Measurement Service For Recreational Off-Highway Vehicles (ROV)

for:
CPSC

May 18, 2010

Vehicle Dynamics Division
7349 Worthington-Galena Rd.
Columbus, Ohio 43085

Vehicle Characteristics Measurement Service For Recreational Off-Highway Vehicles (ROV)

OBJECTIVES

- To obtain vehicle characteristic data that is accurate and repeatable using measurement and test methods that are proven and accepted in the academic and industrial communities.

- To document, study, and compare the dynamic performance characteristics of commonly available ROVs.

TASKS

Task #1 Static Measurements (VIMF Testing)

SEA's Vehicle Inertia Measurement Facility (which includes a vehicle weigh station) will be used to measure: vehicle weight (including the four corner weights); vehicle CG position (longitudinal, lateral, and vertical (CG height)); vehicle pitch, roll, and yaw moments of inertia; and roll/yaw product of inertia. The VIMF tests will provide all of the measurements and technical requirements listed in Section **C.1. Static Measurements** of the original RFQ Statement of Work (SOW). In addition to these measurements, the results from the VIMF tests will be used to compute Static Stability Factor (SSF), Stability Coefficient (KST), and Critical Sliding Velocity (CSV).

Based on previous testing of ROVs, SEA has recognized that ROV vehicle track widths can change significantly as a function of vehicle loading. Therefore, SEA will make track width measurements for all loading conditions tested.

The VIMF tests will be conducted on all test vehicles in the following loading conditions:

1. Curb plus Driver[1]
2. Curb plus Driver and Passenger
3. Curb plus Driver, Passenger, and Cargo Bed Load[2]
4. Curb plus Test Driver Load, Test Instrumentation (including measurement transducers, data acquisition computer, SEA's Automated Steering Controller (ASC), ASC controller box, and ASC battery box), and Safety Outriggers[3]

Loading Condition #4 is the one of two loading conditions that will be used for the Dynamic Test Events. VIMF tests using Loading Condition #4 will be conducted to quantify and evaluate the effects the outriggers (and test equipment necessary to conduct the dynamic tests) have on

[1] Each occupant (Driver and Passenger) load will be equivalent to a 95th percentile Hybrid III weighing nominally 213 lb.
[2] The Cargo Bed Load used will be the lesser of the vehicle manufacturer's maximum cargo bed load or the load required to reach the vehicle manufacturer's GVWR.
[3] Loading Condition #4 will match the total weight of Loading Condition #2. Also, for Loading Condition #4, the lateral and longitudinal CG positions will be made to closely match those of Loading Condition #2.

the vehicle characteristics to be studied. For Loading Condition #3, the Cargo Bed Load will be laterally and longitudinally centered at the approximate geometric center of the bed; and the Cargo Bed Load will be positioned vertically so that its CG is nominally at the height equal to one-half of the height of the sides of cargo bed structure.

Task #2 Static Tests (Tilt Table Testing)

SEA's Tilt Table will be used to measure the Tilt Table Angle (TTA) at two-wheel lift for each vehicle in each loading condition listed below. Driver's side and passenger's side tilts will be performed. The Tilt Table tests will meet all of the technical requirements listed in Section **C.2. Static Test** of the original RFQ SOW. In addition to the measuring TTA, the Tilt Table test results will provide a measure of Tilt Table Ratio (TTR). TTR is the tangent of the TTA.

Based on previous testing of ROVs, SEA has recognized that some ROVs will slide laterally prior to two-wheel lift during tilt table tests conducted using a high friction safety walk (essentially course grid sandpaper) material. To prevent lateral sliding, for some ROV tilt table tests SEA has placed thin metal racks above the high friction safety walk. SEA believes that these tests provided good measurements of TTA and TTR. However, for the CPSC tilt table tests, SEA proposes using perforated or expanded metal floor panels attached to the table to prevent lateral sliding.

The Tilt Table tests will be conducted on all test vehicles in the following loading conditions:

1. Curb plus Driver
2. Curb plus Driver and Passenger
3. Curb plus Driver, Passenger, and Cargo Bed Load
4. Curb plus Test Driver Load, Test Instrumentation (including measurement transducers, data acquisition computer, SEA's Automated Steering Controller (ASC), ASC controller box, and ASC battery box), and Safety Outriggers

Task #3 Dynamic Tests

SEA will install the necessary test equipment (including measurement transducers (OXTS RT3002 Inertial and GPS Navigation System), data acquisition computer, SEA's ASC, ASC controller box, and ASC battery box) and safety outriggers, and conduct a series of dynamic tests on the vehicle on the Vehicle Dynamics Area (VDA) at the Transportation Research Center, Inc. (TRC) in East Liberty, Ohio. SEA anticipates and has budgeted for one full day of dynamic testing per vehicle. The Dynamic Tests will include all of the tests listed in Section **C.4. Dynamic Test Events** of the original RFQ SOW.

With one exception, the test data collected will include all of the channels listed in Section **C.3. Dynamic Test Data** of the original RFQ SOW. SEA recommends that the suspension movement at each wheel location not be measured. Instead, SEA will be using the RT3002 to measure: roll, pitch, and heading angles; roll, pitch, and yaw rates; and GPS positions. SEA believes that the roll angle measures can serve as a surrogate for the suspension movement measurements, and eliminating the suspension movement measurements will greatly simplify the custom test set-up for each vehicle. All test data will be collected using a sampling rate of 100 Hz.

Section **C.4. Dynamic Test Events** of the original RFQ SOW includes the following tests:

1. Dropped throttle J-Turn tests with steering initiation at a set initial speed. Based on previous dynamic testing of ROVs, SEA recommends conducting all of the step steer tests at 30 mph. These tests will provide a measure of the minimum lateral accelerations required to cause two-wheel lifts during the tests.
2. Constant radius circle tests on an asphalt surface using the methods of SAE J266 to plot steering gradient. In previous testing of ROVs, SEA has used a 100 ft. radius circle for conducting these tests with good success. SEA has used the slowly increasing speed method (as opposed to a discrete speed method[4]) to generate the steering gradient characteristic curves. Clockwise and counterclockwise tests well be conducted, and two of each type will be conducted. Results from these tests will include steering gradient (steering angle input as a function of lateral acceleration) and roll gradient characteristic curves (roll angle response as a function of lateral acceleration). The tests will be conducted up to the limits of each vehicle's response, which will be in the range of 0.5 g. or above for most ROVs on a 100 ft. radius circle. The steering gradient characteristic curves will be used to compute linear range understeer gradients as well as to determine if the vehicles' transition to oversteer during the tests. Also, it will be noted if a vehicle tips-up onto the safety outriggers during a circle test. To evaluate the effects of the outriggers during circle tests, one of the vehicles that do not tip-up during the circle tests will be tested without outriggers. Results from the outrigger-on and outrigger-off tests will be compared for one of the vehicles tested.
3. Sinusoidal sweep steering input tests will be conducted at 20 mph (the TRC VDA has adequate length to conduct the sinusoidal sweep tests at this speed). Frequency responses of selected vehicle responses to steering inputs will be generated from these tests over the range of steering inputs applied (SEA recommends using a range of steering inputs of 0.5 Hz to 3.5 Hz).

In addition to the tests listed above, SEA recommends conducting the following relatively simple dynamic tests:

4. Maximum speed tests. These tests involve driving each vehicle in each loading condition in a straight path up to its maximum speed. The measurements of the maximum vehicle speeds will be the results from these tests.
5. Steering flick tests at 30 mph. Steering flick tests involve driving the vehicle along a straight path a quickly 'flicking' the steering wheel to nominally 90 degrees and letting go of the steering wheel. The OEM steering wheels will be used for these tests in place of the ASC. The steering flick maneuvers will be used to evaluate each vehicle's response to open-loop, free control steering inputs. These tests will be used to indicate if a vehicle exhibits excessive oscillatory response to the flick input or if the steering does not return to a close-to-zero position (indicating too little self aligning steering moment).

[4] It is more efficient to conduct slowly increasing speed circle tests than discrete speed circle tests, and the data reduction process is more straightforward. However, the discrete speed circle might be a better test to conduct for the purpose of regulation or certification. The discrete speed circle tests could be conducted at predefined discrete speeds needed to generate discrete lateral acceleration levels. SEA is open to discussions with CPSC regarding conducting discrete speed circle tests.

The Dynamic Test Events will be conducted for all test vehicles in the following two loading conditions:

1. Curb plus Test Driver Load, Test Instrumentation (including measurement transducers, data acquisition computer, SEA's ASC, ASC controller box, and ASC battery box), and Safety Outriggers. This loading condition will match, as closely as possible, the total weight of Loading Condition #2 used for the laboratory tests. Also, for this loading condition, the lateral and longitudinal CG positions will be made to closely match those of Loading Condition #2.
2. Curb plus Test Driver Load, Cargo Bed Load, Test Instrumentation (including measurement transducers, data acquisition computer, SEA's ASC, ASC controller box, and ASC battery box), and Safety Outriggers. This loading condition is the same as Loading Condition #4 that will be used for the laboratory tests.

Task #4 Special Test Equipment

SEA will use the outriggers designed and built for CPSC. SEA is proposing no additional expenses for fitting these CPSC outriggers to the additional three vehicles.

Task #5 Report (and Deliverables)

SEA will reduce all test data, compute all vehicle characterization metrics listed above, plot results from significant dynamic test events, analyze the data, and report on the outcomes for each vehicle. The report will include separate tables, graphs, and charts for each vehicle, as well as tables and/or charts comparing the vehicles. The report will include comparisons of the laboratory based lateral stability (static) metrics to one another, as well as their comparisons to dynamic metrics indicative of rollover propensity (i.e. lateral acceleration at tip-up). Also, photos of each vehicle will be provided, including photos showing the outriggers, loading configurations, and test instrumentation and equipment.

SEA will retain all test data and provide any or all data to CPSC as they desire.

SEA will videotape portions of the dynamic testing, to document the testing. SEA will provide all video to CPSC as they desire.

VEHICLES
In the RFQ Mod 0003, CPSC listed three vehicles:

1. Polaris RZR – 4 Passenger
2. Yamaha Rhino – Newer Version than 2009 MY Already Tested
3. John Deere

This modification proposal of CPSC contract # CPSC-S-10-0014 is based on testing three additional vehicles. This proposal does not include purchasing any vehicles, tires or rims needed to conduct the testing. Transportation costs between CPSC and SEA are listed below (Transportation Services). Transportation costs between SEA and TRC are included in the dynamic testing portion of this quotation. All SEA equipment rental costs and TRC facility rental costs are included.

PROPOSAL: COST QUOTATION FOR TASKS #1, #2, #3, #5, and transportation services.

Item	Cost
Task #1 Static Measurements (VIMF Testing)	**$ 12,375**
Task #2 Static Tests (Tilt Table Testing)	**$ 7,000**
Task #3 Dynamic Tests	**$ 43,320**
Task #5 Report (and Deliverables)	**$ 10,353**
Transportation Services (Four total round trips at $ 1,082.50 per trip)	**$ 4,330**
TOTAL	**$ 77,378**