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)
0008	06/08/2010	REQ-4400-10-0012	

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)

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
ATTN STEVEN EMMERICH
100 BUREAU DRIVE MS-8602
GAITHERSBURG MD 20899-8630

CODE [redacted] FACILITY CODE

(x) 9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

X 10A. MODIFICATION OF CONTRACT/ORDER NO.
CPSC-I-06-0012

10B. DATED (SEE ITEM 13)
07/26/2006

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: $20,000.00
0100A10DPS 2010 2333600000 EXHR004400 253A0

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	MUTUAL AGREEMENT BETWEEN THE PARTIES
	D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor ☐ is not, ☒ 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]

IAG CPSC-I-06-0012 is hereby modified to add additional tasks, revise the delivery schedule and revise the schedule of task costs and performance as follows:

1) Line Item 0016 (Task A-4, page 7) is hereby removed.
2) Delivery Schedule, page 10, is revised to incorporate Tasks J and SO1-7.
3) Schedule of Task Costs and Performance, pages 11 and 12, is revised as attached.

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)	
		Donna Hutton	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
[redacted] (Signature of person authorized to sign)	7-1-10	(Signature of Contracting Officer)	06/08/2010

CONTINUATION SHEET	REFERENCE NO. OF DOCUMENT BEING CONTINUED	PAGE	OF
	CPSC-I-06-0012/0008	2	2

NAME OF OFFEROR OR CONTRACTOR
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

ITEM NO (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
	The total amount of this agreement is increased by $20,000.00, from $538,000.00 to $558,000.00. The period of performance of the Basic Contract extends through May 15, 2011. Discount Terms: Net 30 Payment: CONSUMER PRODUCT SAFETY COMMISSION DIVISION OF FINANCIAL SERVICES 4330 EAST WEST HWY ROOM 522 BETHESDA MD 20814 FOB: Destination Change Item 0016 to read as follows(amount shown is the obligated amount): Task A4 (see attached) Period of Performance: 08/15/2008 to 12/07/2009 Add Item 0019 as follows: Task J (see attached) Period of Performance Ends: 05/15/2011 Add Item 0020 as follows: Task SO1-7 (see attached) STEVEN EMMERICH NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY BUILDING AND FIRE RESEARCH LABORATORY 100 BUREAU DRIVE, MAIL STOP 8633 BUILDING 226, ROOM A317 301-975-6459 Period of Performance Ends: 05/15/2011 ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED AND IN FULL FORCE AND EFFECT.				
0016		1	EA	0.00	-10,000.00
0019		1	EA	22,000.00	22,000.00
0020		1	EA	8,000.00	8,000.00

Modification No.8 to CPSC-I-06-0012
INTERAGENCY AGREEMENT BETWEEN THE
U.S. CONSUMER PRODUCT SAFETY COMMISSION AND
THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

1. Introduction

The U.S. Consumer Product Safety Commission, hereinafter referred to as CPSC, and the National Institute of Standards and Technology, hereinafter referred to as NIST, hereby agree that NIST shall provide services in accordance with this modification to the statement of work of IAG CPSC-I-06-0012. All tasks specified in IAG CPSC-I-06-0012 not amended in this modification shall remain in full force and effect. The new and modified existing tasks shall be completed in accordance with the schedule included in this modification. This modification includes the following: (1) adding and funding additional tests in the NIST test house/garage facility and (2) removing the existing task A4.

2. Title

Modeling and Measuring the Effects of Portable Gasoline Powered Generator Exhaust on Indoor Time Course Carbon Monoxide Profiles

3. Purpose

There are three purposes for this modification. First, SO1, the low CO emitting prototype generator equipped with a shutoff algorithm programmed into the engine's controller, has an upgraded controller on it that provides greater control of the engine's air-to-fuel ratio (AFR) than the controller on modGenX, the first low CO emitting prototype generator delivered to NIST. For a given engine load, the AFR is the primary factor that determines the CO emission rate. Since one of the main purposes of this IAG is to compare the performance of a carbureted off-the-shelf generator to one modified into the prototype configuration when operated in an attached garage, it is important to make the comparison using the better performer of the two prototypes. The new garage tests will enable staff to directly compare empirical results obtained from testing SO1 and modGenX under similar conditions. While the existing garage tests still to be

performed will also enable this comparison, the new garage tests included in this modification add new test conditions, namely tests with constant load applied as well as with the garage bay door fully open. The second purpose of this modification is to allow for additional tests that will more fully characterize the performance of SO1 when operated in the garage than the existing tests entail. These tests will examine when oxygen depletion occurs, when the AFR shifts off the design point, and if either of these two conditions correspond to when CO concentration rise in the garage increases rapidly. This modification serves these purposes by including two new tasks, J and SO1-7.

The third purpose of this modification is to remove task A4.

4. Statement of Work

Under the section entitled Delivery and Performance, delivery items J and SO1-7 have been added. Task A4 is not to be conducted. Task SO1-3 has been modified to test with loads that are nominally 10% and 50% of full generator load Task M7 has been modified to include the garage test results from tests using GenX, modGenX, SO1, and GenB in the progress report; shed test results do not need to be included. Also added to task M7 is delivery of the electronic data files containing the test data from those tests. The performance schedule for all tasks, new and existing, has been adjusted accordingly. Future adjustments in the tasks may be made by mutual agreement between CPSC and NIST.

5. Period of Performance

The period of performance shall begin on the effective date of this modification. This work shall not extend beyond May 15, 2011 as scheduled (see paragraph 6, "Delivery and Performance.") This agreement may be modified by mutual consent of the CPSC and NIST.

6. Delivery and Performance

All deliverables required under the terms and conditions of this IAG modification shall be provided to the CPSC. The following items shall be performed or delivered to CPSC in accordance with the schedule below

(starting from the new modified start date of xxx):

Delivery Item	Performance Schedule	
M1.	NIST will conduct characterization and calibration tests in the newly constructed garage attached to the existing manufactured house, including, but not necessarily limited to blower door, mixing, and pulse injection.	Completed
M2.	NIST will conduct tests with the unmodified generator in the one-zone test shed (the test were moved for safety considerations from the "NIKE test house to a newly constructed facility adjacent to the test house with attached garage) to measure CO and O_2 concentrations and establish baseline CO emission rates. These tests will be conducted at 6 load levels specified by CPSC staff and corresponding as closely as possible to the load levels in the profile being used by the contractor developing the CO emission mitigation technology.	Completed
M3.	NIST will conduct tests with the unmodified generator installed in the attached garage and will conduct measurements in the manufactured house and attached garage for CO, O_2 and transport of CO into the adjacent living space due to operation of a portable generator in the attached garage under conditions as close as possible to real-world operation. These tests will be conducted at a variable load level profile as	Completed

	specified by CPSC staff, corresponding as closely as possible to the profile being used by contractor developing the CO emission mitigation technology and at multiple air change rates.	
A1	NIST will conduct constant load tests with the unmodified generator in the one-zone test shed to measure CO and O_2 concentrations and establish baseline CO emission rates. These tests will be conducted at 3 separate load levels specified by CPSC staff. 3 tests will be conducted at "high O_2" levels corresponding closely to ambient O_2 and 3 tests will be conducted at "low O_2" levels corresponding closely to the lowest O2 level observed when the generator was operated in the garage under "low O_2" conditions.	Completed
A2	NIST will conduct variable load tests with the unmodified generator installed in the one-zone test shed to measure the CO generation rates resulting from operating the generator with a variable load approximating typical electrical loads that would be present at a residence during a power outage. The loads to be applied will include, at minimum, a refrigerator, light fixtures totaling ~240 watts and either the HVAC circulating fan or portable window air conditioner. Full loading shall correspond approximately to the maximum loading recommended by the generator manufacturer.	Completed
M4.	NIST will conduct measurements in the manufactured house and	Completed

	attached garage for CO, O_2 and transport of CO into the adjacent living space resulting from operating Generator B in the attached garage. Tests will be conducted at 2-3 generator load levels specified by CPSC staff and at up to 3 different air exchange rates with the garage door open/closed and with the HVAC system both on and off.	
K	NIST will conduct a series of 12 or fewer tests under varying environmental, load, and warm-up conditions to investigate the performance of the prototype system under varying O2 levels established by adjusting the opening of the garage bay door on the single car garage attached to the NIST test house and the opening of the door between the garage and house. These tests will capture: engine performance data (AFR, hydrocarbon (HC) concentration in the exhaust, engine cylinder head temperature, engine oil temperature, exhaust manifold temperature, muffler skin temperature, midstream exhaust temperature leaving the tailpipe, muffler shroud temperature); garage environmental conditions (O2 levels, CO levels, HC levels); generator power output; and house environmental conditions (CO, HC, and O2 levels). Garage environmental conditions shall be set by stepwise adjustment of the bay door opening between fully open and completely closed, and by the position of the door between the garage and house, which will be either completely closed or open 2 inches. Tests	Completed

	will be conducted on portable generator in two configurations, 1) EFI and a non-catalyst-equipped muffler, and 2) with EFI and a catalyst-equipped muffler. Tests will be conducted at 100% generator load and at 50% generator load.	
M5.	NIST will conduct tests with the modified generator in the one-zone test shed to measure CO and O_2 concentrations and establish baseline CO emission rates. These tests will be conducted at 6 load levels specified by CPSC staff and corresponding as closely as possible to the load levels in the profile being used by the contractor developing the CO emission mitigation technology. Tests will be conducted as closely as possible to the O_2 levels achieved in the tests conducted under task M2.	Completed
J	NIST will conduct measurements in the manufactured house and attached garage for CO, O_2 and transport of CO into the adjacent living space resulting from operating each of Gen B, SO1, and modGenX in the attached garage when tested under similar conditions. The load and door opening conditions differ from those used in task M3.	To be completed by end of May 2010
A3	NIST will conduct constant load tests with the generator modified to include a CO mitigating system in the one-zone test shed to measure CO and O_2 concentrations and establish baseline CO emission rates. These tests will	To be completed by end of March 2010

	be conducted at 3 separate load levels specified by CPSC staff. 3 tests will be conducted at "high O_2" levels corresponding closely to ambient O_2 and 3 tests will be conducted at "low O_2" levels corresponding closely to the lowest O2 level observed when the generator was operated in the garage under "low O_2" conditions. These tests will be also conducted under as near as possible the same ambient conditions as those encountered during the conduct of task A1.	
A4	NIST will conduct variable load tests with the modified generator installed in the one-zone test shed to measure the CO generation rates resulting from operating the generator with a variable load approximating typical electrical loads as described in task A2. The tests will be conducted at the high and low O2 levels in task A3. Full loading shall correspond to approximately the maximum loading recommended by the generator manufacturer.	Removed
SO1-1	NIST will develop, in consultation with CPSC staff, a preliminary test matrix for a series of approximately 32 tests to accomplish the tasks designated as SO1-2 through SO1-6 below.	Completed
SO1-2	NIST will conduct testing to determine and then verify the amount of garage door closure required to activate the shutoff feature on prototype SO1 at full generator load. The time course CO profiles for various locations in the home will be recorded	To be completed by end of May 2010

	during these tests.	
SO1-3	NIST will conduct tests at nominally 10 and 50 percent generator load to determine and then verify the amount of garage door closure required to activate the shutoff feature on prototype SO1. The time course CO profiles for various locations in the home will be recorded during these tests.	To be completed by end of May 2010
SO1-4	NIST will conduct tests when SO1 is operated in the garage with the garage door fully closed. The time course CO profiles for various locations in the home will be recorded during these tests.	To be completed by end of May 2010
SO1-5	NIST will conduct tests with the shutoff feature on SO1 deactivated to determine the time course CO profile at various locations in the home.	To be completed by end of May 2010
SO1-6	NIST will conduct tests with the previously-tested stock portable generator (Gen B) under the same conditions that activated the shutoff feature on prototype SO1.	To be completed by end of May 2010
SO1-7	NIST will conduct tests that will more fully characterize the performance of SO1 when operated in the garage. These tests will examine when oxygen depletion occurs, when the AFR shifts off the design point, and if either of these conditions correspond to when CO concentration rise in the garage increases rapidly.	To be completed by end of May 2010
M6.	NIST will conduct tests with the modified generator installed in the attached garage and will	To be completed by end of May 2010

	conduct measurements in the manufactured house and attached garage for CO, O_2 and transport of CO into the adjacent living space due to operation of a portable generator in the attached garage under conditions as close as possible to real-world operation. These tests will be conducted at a variable load level profile as specified by CPSC staff, corresponding as closely as possible to the profile being used by contractor developing the CO emission mitigation technology and at multiple air change rates.	
M7.	NIST will provide a progress report of the results of the measurements taken with GenX, modGenX, SO1, and GenB in the test house and attached garage. This will include a description of the instrumentation, experimental plan, and measurements. Electronic files containing the test data will also be provided so CPSC staff can perform health assessments on potential occupants in different rooms in the house using the measured CO time course profiles.	To be completed by Aug 13, 2010 (75 days after completion of task M6)
M8	Validation Simulations	To be completed by Oct 12, 2010 (60 days after completion of task M7)
M9	Complete garage scenario simulations including unmodified and modified generator tests.	To be completed by Jan 30, 2011 (110 days after completion of task M8)
M10.	Deliver draft report on entire project to CPSC staff for review.	To be completed by March 31, 2011 (60

		days after completion of task M9)
M11.	Deliver final report on entire project reflecting CPSC staff comments	To be completed by May 15, 2011 (45 days after completion of task M10)

7. **Schedule of Task Costs**

Task	Description	Cost of Modification
Task M1	Conduct characterization and calibration tests in the newly constructed garage	No added cost
Task M2	Conduct tests with the unmodified generator in the one-zone test shed	No added cost
Task M3	Conduct tests with the unmodified generator installed in the attached garage with measurements in the manufactured house	No added cost
Task A1	Conduct constant load tests with the unmodified generator in the one-zone test shed at "high O_2" levels" and at "low O_2" levels	No added cost
Task A2	Conduct variable "real" load tests with the unmodified generator in the one-zone test shed at "high O_2" levels and at "low O_2" levels	No added cost

Task	Description	Cost of Modification
Task M4	Conduct measurements in the manufactured house and attached garage for CO, O_2 and transport of CO into the adjacent living space resulting from operating Generator B in the attached garage	No added cost
Task K	Conduct a series of 12 or fewer tests under varying environmental, load, and warm-up conditions to investigate the performance of the prototype system under varying O2 levels established by adjusting the opening of the garage bay door on the single car garage attached to the NIST test house and the opening of the door between the garage and house.	No added cost
Task M5	Conduct tests with the modified generator in the one-zone test shed to measure CO and O_2 concentrations and establish baseline CO emission rates	No added cost
Task J	Conduct measurements in the manufactured house and attached garage for CO, O_2 and transport of CO into the adjacent living space resulting from	$22,000, but $10,000 from task A4, which is being removed in this modification,

Task	Description	Cost of Modification
	operating each of Gen B, SO1, and modGenX in the attached garage when tested under similar conditions. The load and door opening conditions differ from those used in task M3.	is applied towards it for a net cost of $12K
Task A3	Conduct constant load tests with the modified generator in the one-zone test shed at "high O_2" levels and at "low O_2" levels	No added cost
Task A4	Conduct variable "real" load tests with the modified generator in the one-zone test shed at "high O_2" levels and at "low O_2" levels	Removed
SO1-1 through SO1-6	Shutoff performance tests	No added cost
SO1-7	Conduct tests that will more fully characterize the performance of SO1 when operated in the garage.	$8K
Task M6	Conduct tests with the modified generator installed in the attached garage and conduct measurements in the manufactured house and attached garage	No added cost

Task	Description	Cost of Modification
M7	Provide a progress report on the results of the measurements taken with the pre- and post-modification generator in the test house and attached garage	No added cost
M8	Validation Simulations	No added cost
M9	Complete garage scenario simulations including unmodified and modified generator tests	No added cost
M10	Provide a draft report on entire project for CPSC staff review	No added cost
M11	Provide a final report on entire project reflecting CPSC staff comments	No added cost

7. Termination

Any party may terminate this Agreement by providing sixty (60) days written notice to the other party. If the requesting agency cancels the order, NIST is authorized to collect costs incurred prior to cancellation of the order plus any termination costs. The total value of the Agreement, including termination costs, will not exceed $25,000.

8. Disagreements

Should disagreement arise on the interpretation of the provisions in this Agreement, the dispute shall be resolved pursuant to the Business Rules for Intragovernmental Transactions delineated in the Treasury Financial Manual,

Vol. 1, Bulletin 2007-03, Section VII (Resolving Intra-governmental Disputes and Major Differences).

9. **Liaison Officers**

A. NIST Project Officer

Steven Emmerich
National Institute of Standards and Technology
Building and Fire Research Laboratory
100 Bureau Drive, Mail Stop 8633
Building 226, Room A317
Gaithersburg, MD 20899-8663
Phone: (301) 975-6459

B. CPSC Project Officer

Janet Buyer
U.S. Consumer Product Safety Commission
Directorate for Engineering Sciences
4330 East-West Highway, Room 611
Bethesda, MD 20814
Phone: (301) 504-7542

C. CPSC Finance Officer

U.S. Consumer Product Safety Commission
Directorate for Administration
Accounting Operations
4330 East-West Highway, Room 522
Bethesda, MD 20814

Agency Payment Officer:
Deborah Hodge
Phone: 301-504-7130

10. **Cost and Transfer of Funds**

The total cost for this modification is $20,000.00. The funding for this IAG modification will be provided by the CPSC with FY 2010 Funds.

11. **Funding and Accounting Data**

The transfer of funds shall be from CPSC to NIST through the On-Line Payment Collection (OPAC) system using the following accounting data:

Transfer from:

CPSC

FUNDING CODE: 0100A10DPS 2010 2333600000 EXHR004400 253A0

AMOUNT: $20,000.00
CPSC Agency Location Code: 61-00-0001
CPSC US Treasury Code: 6100100
CPSC DUNS number: 069287522
CPSC Taxpayer ID Number: 520978750
Date funds expire: 09/30/2011
Business Event Type Code: DISB

To:

NIST

FUNDING CODE:
NIST Agency Location Code: 1341
NIST DUNS number: 929956050
NIST Taxpayer ID Number: 53-0205706
Treasury Account Symbol: 13X4650
Business Event Type Code: COLL

12. Authority

For CPSC:

Section 29(d) of the Consumer Product Safety Act, (15 U.S.C. 2078(d)).

For NIST:

15 U.S.C. Section 272(b)11) and (c)(8) and Section 278.

13. **Approved and Accepted:**

Servicing Agency - NIST:

SIGNATURE: _____

PRINTED NAME: D. Hunter Fanney

TITLE: Division Chief

DATE: 6-30-2010

Requesting Agency - CPSC:

SIGNATURE: _____

PRINTED NAME: Donna Hutton

TITLE: Contracting Officer

DATE: 6/8/2010

Memorandum for the Record June 7, 2010

Subject: CPSC-I-06-0012

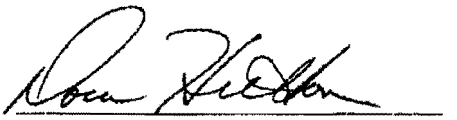
1. This interagency agreement is established between the Consumer Product Safety Commission (CPSC) and the National Institute of Standards and Technology (NIST). NIST shall provide technical support for modeling the resulting time course profiles of carbon monoxide (CO) concentrations in various locations throughout the home as a consequence of operating a gasoline-powered portable generator in the garage of a home.

   Phase I will model effects on indoor residential CO levels resulting from scenarios where a portable generator is operated in an attached garage. Phase II will explore the feasibility of examining the impacts of generator use outside the home, under various use and ambient conditions.

2. This service is essential to the work of the CPSC staff to carry out its obligations in developing recommendations for product design changes and developing consumer guidelines for proper locations to safely operate portable generators around the home.

3. NIST has unique and specialized knowledge, capabilities and facilities to perform this service which are not available at CPSC. These services cannot be obtained as conveniently or economically by contracting directly with a private source.

4. The most effective method of obtaining these services is by obtaining them from NIST. Therefore, use of this interagency acquisition is determined to be in the best interest of the Government.



Donna Hutton
Contracting Officer