


AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT D CODE		PAGE OF PAGES	
						1 18	
2. AMENDMENT/MODIFICATION NO.		3. EFFECTIVE DATE		4. REQUISITION/PURCHASE REQ. NO.		5. PROJECT NO. (If applicable)	
M0012		See Block 16C		ZEROREQ-RES-18-0038			
6. ISSUED BY		CODE		7. ADMINISTERED BY (If other than Item 6)		CODE	
US NRC - HQ		NRCHQ					
ACQUISITION MANAGEMENT DIVISION							
MAIL STOP TWFN-8E06M							
WASHINGTON DC 20555-0001							
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)				(x) 9A. AMENDMENT OF SOLICITATION NO.			
UNIVERSITY OF MICHIGAN							
ATTN KULLIE KENNEDY				9B. DATED (SEE ITEM 11)			
503 THOMPSON ST							
ANN ARBOR MI 481091340				x 10A. MODIFICATION OF CONTRACT/ORDER NO.			
				NRC-HQ-60-15-C-0012			
				10B. DATED (SEE ITEM 13)			
CODE 073133571		FACILITY CODE		09/28/2015			
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS							
<input type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers <input type="checkbox"/> is extended <input type="checkbox"/> 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)							
See Schedule							
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) 52.243-3 Changes. Time-and-Materials or Labor-Hours (SEPT 2000)						
E. IMPORTANT Contractor <input type="checkbox"/> is not. <input checked="" type="checkbox"/> is required to sign this document and return <u>1</u> copies to the issuing office.							
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)							
The purpose of this modification is to:							
1. Increase the ceiling of the contract from \$1,583,545.00 by \$178,291.00 to \$1,761,836.00; and							
2. Revise various sections of the contract.							
See the attached for detailed information.							
Total Contract Ceiling: \$1,761,836.00. (Changed)							
Total Contract Funding: \$833,936.17. (Unchanged)							
Period of Performance: Oct 1, 2015 through Sept 30, 2020. (Unchanged)							
Continued ...							
Except as provided herein, all terms and conditions of the document referenced in Item 9 A 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)			
				ERIKA EAM			
15B. CONTRACTOR/OFFEROR		15C. DATE SIGNED		16B. UNITED STATES OF AMERICA		16C. DATE SIGNED	
(Signature of person authorized to sign)						03/16/2018	
				(Signature of Contracting Officer)			

NAME OF OFFEROR OR CONTRACTOR
UNIVERSITY OF MICHIGAN

ITEM NO. (A)	SUPPL ES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
	<p>LIST OF CHANGES:</p> <p>Reason for Modification : Other Administrative Action</p> <p>Total Amount for this Modification: \$178,291.00</p> <p>New Total Amount for this Version: \$1,761,836.00</p> <p>New Total Amount for this Award: \$1,761,836.00</p> <p>IPP Department ID changed to :</p> <p>CHANGES FOR LINE ITEM NUMBER: 1</p> <p>Total Amount changed</p> <p>from \$1,583,545.00 to \$1,761,836.00</p> <p>CHANGES FOR DELIVERY LOCATION: NRCHQ</p> <p>Amount changed from \$1,583,545.00 to \$1,761,836.00</p> <p>Delivery Location Code: NRCHQ</p> <p>US NUCLEAR REGULATORY COMMISSION- MAIL PROCESSING CENTER 4930 BOILING BROOK PARKWAY ROCKVILLE MD 20852 USA</p> <p>Period of Performance: 10/01/2015 to 09/30/2020</p>				

Accordingly, the following specific change is to be made to the Contract:

1. **Standard Form (SF) 26, Block 15G TOTAL AMOUNT OF CONTRACT**, delete in its entirety and replace with the following, "\$1,761,836.00";
2. **SECTION B – SUPPLIES OR SERVICES AND PRICE/COSTS:**
 - a. **CONSIDERATION AND OBLIGATIONS – COST REIMBURSEMENT-NO FEE (AUG 2011) ALTERNATE I (AUG 2011)**, (a), delete in its entirety and replace with the following:
“(a)The total estimated cost to the Government for full performance under this contract is \$1,761,836.00.”
 - b. **PRICE SCHEDULE**, delete in its entirety and replace with the following,

“ITEM NO.	DESCRIPTION OF SUPPLIES/SERVICES	ESTIMATED COST
00001	Enhancing Guidance for Evacuation Time Estimate Studies	\$1,761,836.00
Total Estimated Cost		\$1,761,836.00

*All travel must receive prior approval from the Contracting Officer’s Representative (COR)”

3. **SECTION G – CONTRACT ADMINISTRATION DATA, NRCG030 ELECTRONIC PAYMENT (SEP 2014)**, delete in its entirety and replace with the following:

“ELECTRONIC PAYMENT (DEC 2017)

The Debt Collection Improvement Act of 1996 requires that all payments except IRS tax refunds be made by Electronic Funds Transfer. Payment shall be made in accordance with FAR 52.232-33, entitled “Payment by Electronic Funds-Central Contractor Registration”.

To receive payment, the contractor shall prepare invoices in accordance with NRC’s Billing Instructions. Claims shall be submitted through the Invoice Processing Platform (IPP) (<https://www.ipp.gov/>). Back up documentation shall be included as required by the NRC’s Billing Instructions.

(End of Clause)”

4. **SECTION H – SPECIAL CONTRACT REQUIREMENTS, 2052.215-70 KEY PERSONNEL (JAN 1993)**, delete table embedded in this section in its entirety and replace with the following:

“Principal Manager	Thomas Downer
Senior Engineer	Yunlin Xu
Research Associate	Andrew Ward
Research Associate	Volkan Seker
Technical Expert	Won Sik Yang”

**5. SECTION J – LIST OF DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENTS,
ATTACHMENT A – PARCS SOW**

- a. **C.6 List of Services/Deliverable, C.6.1 Specific Tasks**, add the following in its entirety:

“Task 10 – PARCS Upgrades for Fast Spectrum Reactors

There is a renewed interest in several non-LWR advanced reactor concepts among nuclear vendors, some of which have proposed fast-spectrum designs that the NRC may consider for design certification within a few years.

Among these posited advanced reactor concepts are several fast-spectrum advanced reactor designs. Historically, fast reactors have employed many more energy groups (~30) than is generally used for LWR analysis (~2), and the fuel bundle is generally shaped into a hexagon, with liquid metal (lead, bismuth) or sodium coolant. PARCS currently employs a hexagonal nodal method that is tested against VVER-type, thermal spectrum cores, both when coupled to TRACE and in PARCS standalone mode when coupled to PATHS for fuel cycle calculations.

Versions of PARCS have been applied to fast spectrum design concepts within the framework of Generation IV International Forum. Specifically, two CAMP member organizations GRS (Gesellschaft für Anlagen- und Reaktorsicherheit) and PSI (Paul Scherrer Institute) have conducted studies of fast spectrum systems with PARCS. In the case of PSI, in-house capabilities were developed for the analysis of critical (and sub-critical) fast spectrum systems, with generic applicability to the several fast reactor types being considered by Generation IV (gas-cooled, lead-cooled, and sodium-cooled fast reactors).

In sodium cooled fast reactor systems, it is necessary to adjust the parameterization of the reactivity coefficients to account for significant feedback due to fuel displacement in the radial and axial directions, in addition to the Doppler and coolant density feedback. The NRC has obtained the source code changes that PSI completed on an older PARCS version (~2008). The purpose of this task is to port those changes to the most recent official PARCS version; test these changes in a regression (code-to-code) and assessment (code-to-data) sense; document the necessary code change(s) (in terms of new and revised input cards) in a revised user manual; and document the code assessment against available benchmarks.

Subtask 10.1: Fast reactor cross section methodology.

The contractor shall formulate a cross section methodology that captures the dominant reactivity feedback effects of fast reactor analysis in terms of the sensitivity of a bundle eigenvalue in terms of bundle state parameters. This shall be done with U-10Zr fuel alloy.

- a. For a single representative fast reactor lattice, develop a series of lattice models that branch at state parameters of interest for fast reactor analysis (fuel temperature,

average coolant density, average core radius, average fuel height, control rod position, and [exposure, history]). The contractor has freedom over what methodology to employ for the development of these models (SERPENT, SCALE, MCNP, HELIOS, ERANOS, etc.), and how the models are to be generated (Fulcrum, scripts, SNAP, etc.). The contractor also can select models from what is publicly available (Phenix, EBR-II).

- b. Perform a sensitivity study of the lattice eigenvalue to gradients of the state parameters (and of variants of the state parameters, for example, the natural logarithm of fuel temperature instead of the square root of the fuel temperature).
- c. Document this study in a short report for inclusion in the GenPMAXS manual.

Deliverable One for Subtask 10.1: Fast reactor lattice models.

The contractor shall deliver a suite of parameterized fast reactor lattice models.

These models shall be delivered to the 60 business days after task commencement.

Deliverable Two for Subtask 10.1: Cross section methodology study.

The contractor shall deliver a report documenting the cross section study at a level of detail that is consistent with the current GenPMAXS manual.

This report shall be delivered 90 business days after task commencement.

Subtask 10.2: Upgrade GenPMAXS/XSEC block for fast reactor.

The contractor shall develop a methodology for incorporating the unique feedback effects of fast reactor analysis into GenPMAXS (PMAXS format) and/or the XSEC block (native format) of PARCS.

Deliverable One for Subtask 10.2: GenPMAXS/XSEC Block Code Modifications.

The contractor shall deliver GenPMAXS/PARCS version(s) that incorporate the fast reactor cross section parameterizations that were explored in Subtask 10.1

This code version shall be delivered 90 business days after task commencement.

Deliverable Two for Subtask 10.2: GenPMAXS/XSEC block test problems.

The contractor shall deliver a set of test problems (GenPMAXS, PARCS, or both) that test and demonstrate the new cross section parameterizations that were explored in Subtask 10.1.

These test problems shall be delivered 90 business days after task commencement.

Subtask 10.3: Migrate PSI modifications to official PARCS version.

The contractor shall migrate the existing PSI modifications to the latest official PARCS version. These changes shall capture the reactivity effects that were explored in Subtask 10.1, and these changes shall be consistent with executing the TPEN kernel of PARCS with multiple energy groups (greater than 2).

Deliverable One for Subtask 10.3: PARCS code distribution (in addition to the code changes already incorporated for the XSEC block in Subtask 10.2). This shall be a consistent code

distribution with accompanying source code, build scripts, and documentation describing the new functionality.

The contractor shall deliver this PARCS distribution 150 business days after task commencement.

Deliverable Two for Subtask 10.3: PARCS fast reactor test problems (in addition to the test problems already developed to test the changes made to GenPMAXS and the XSEC block in Subtask 10.2).

The contractor shall deliver these PARCS fast-reactor test problems 180 business days after task commencement. These surrogate test problems shall test PARCS in standalone mode, steady state and transient. If needed, the contractor can freeze thermal-hydraulic feedback.

Subtask 10.4: Coupled physics validation and testing of TRACE/PARCS.

The contractor shall develop coupled test problems (point kinetics and spatial kinetics) that validate TRACE/PARCS against relevant evaluated benchmarks or plant data that were captured as part of a fast reactor research program (i.e., EBR-II, Phenix, etc.).

Deliverable One for Subtask 10.4: TRACE/PARCS coupled test problems developed for a fast reactor problem. There shall be two versions of these coupled test problems (point kinetics and spatial kinetics).

The contractor shall deliver this PARCS distribution 90 business days after the commencement of Subtask 10.4, which will begin when a TRACE version that can model fast reactor transients is ready (this will TRACE version will be developed by another organization).

Deliverable Two for Subtask 10.4: Completion report for coupled TRACE/PARCS assessment.

The contractor shall deliver a completion report detailing the assessment of TRACE/PARCS against fast reactor data, 150 business days after task commencement. This report can also compare TRACE/PARCS to other codes.

Subtask 10.5: PARCS method development

The contractor shall review or develop a nodal method to be able to accommodate an expected sodium fast reactor design.

Deliverable One for Subtask 10.5: TRACE/PARCS coupled test problems developed for a fast reactor problem. There shall be two versions of these coupled test problems (point kinetics and spatial kinetics).

For each code development activity, the contractor shall develop the following documentation, per the guidance specified in NUREG-1737:

Software Requirements Specification (SRS)

The SRS is a technical document that focuses on the underlying algorithms, technical specifications, and requirements of the software.

Software Design and Implementation Document (SDID)

The SDID describes the implementation of the technical specifications and algorithms outlined in the SRS, i.e., how the software will be structured and designed.

Qualification Test Plan (QTP) (also referred to as the “test plan” in NUREG-1737)

The Qualification Test Plan is a document which describes how the implemented capability will be tested, i.e. the test problems which will be used to demonstrate the new capability.

These documents shall be provided to the COR prior to commencement of any code development. The contractor shall not proceed with code development until prior written approval has been received from the COR. For each code development activity the contractor shall include the development name as part of the deliverable title.

Deliverable One for Subtask 10.5: Software Requirements Specification (SRS)

The SRS shall be delivered within 30 business days after Subtask 10.5 commencement.

Deliverable Two for Subtask 10.5: Software Design and Implementation Document (SDID)

The SDID shall be delivered within 40 business days after Subtask 10.5 commencement.”

b. C.6 List of Services/Deliverable, C.6.2 Table of Deliverables, add the following in its entirety:

Task #	Deliverable #	Deliverable	Deliverable Due Date	Acceptance Criteria	Deliverable Format
10.1	One	Fast reactor lattice models.	Within 60 business days of task commencement.	Distribution contains required content	Archived with SecureZIP Transmitted via mechanism specified by COR
10.1	Two	Cross section methodology study.	Within 90 business days of task commencement.	Distribution contains required content	Archived with SecureZIP Transmitted via mechanism specified by COR

Task #	Deliverable #	Deliverable	Deliverable Due Date	Acceptance Criteria	Deliverable Format
10.2	One	GenPMAXS/XS EC Block Code Modifications.	Within 90 business days of task commencement.	Distribution contains required content	Archived with SecureZIP Transmitted via mechanism specified by COR
10.2	Two	GenPMAXS/XS EC block test problems	Within 90 business days of task commencement.	Distribution contains required content	Archived with SecureZIP Transmitted via mechanism specified by COR
10.3	One	PARCS code distribution	Within 150 business days of task commencement.	Distribution contains required content	Archived with SecureZIP Transmitted via mechanism specified by COR
10.3	Two	PARCS fast reactor test problems	Within 180 business days of task	Distribution contains required	Archived with SecureZIP

Task #	Deliverable #	Deliverable	Deliverable Due Date	Acceptance Criteria	Deliverable Format
			commencement.	content	Transmitted via mechanism specified by COR
10.4	One	PARCS code distribution	Within 90 business days of task commencement.	Distribution contains required content	Archived with SecureZIP Transmitted via mechanism specified by COR
10.4	Two	PARCS fast reactor test problems	Within 150 business days of task commencement.	Distribution contains required content	Archived with SecureZIP Transmitted via mechanism specified by COR

c. **C.7 Estimated Level-of-Effort (LOE)**, delete in its entirety and replace with the following:

“C.7 Estimated Level-of-Effort (LOE)”

This estimate is advisory only and not to be considered as the sole basis for development of a staffing plan.

The total estimated level of effort for this project over the 12-month base period and four 12-month option periods is 14,457 staff hours. The estimated distribution of the effort for this task is described in the following table.

LEVEL OF EFFORT TABLE	
LABOR CATEGORY	LEVEL OF EFFORT
Summary	(All Five Years)
Project Manager	1,448
Senior Engineer	5,837
Research Associate PARCS/GenPMAXS	5,006
Research Associate TRIPEN/AGREE	2,166
Total Level of Effort	14,457

LABOR CATEGORY	LEVEL OF EFFORT
Base Year 1	
Project Manager	265
Senior Engineer	1018
Research Associate PARCS/GenPMAXS	740
Research Associate TRIPEN/AGREE	625
Total Level of Effort	2648

LABOR CATEGORY	LEVEL OF EFFORT
Base Year 2	
Project Manager	291
Senior Engineer	1192
Research Associate PARCS/GenPMAXS	810
Research Associate TRIPEN/AGREE	616
Total Level of Effort	2909

LABOR CATEGORY	LEVEL OF EFFORT
Base Year 3	
Project Manager	312
Senior Engineer	979
Research Associate PARCS/GenPMAXS	1408
Research Associate TRIPEN/AGREE	415
Total Level of Effort	3114

LABOR CATEGORY	LEVEL OF EFFORT
Base Year 4	
Project Manager	332
Senior Engineer	1387
Research Associate PARCS/GenPMAXS	1234
Research Associate TRIPEN/AGREE	360
Total Level of Effort	3313"

d. **C.11 Government-Furnished Property**, add the following in its entirety:

"GFP Item	Quantity	Date provided to contractor	Method of Shipment
TRACE version that can model fast reactor systems	1	When TRACE version ready	Electronic"

6. **SECTION J – LIST OF DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENTS**, add the following in its entirety:



Version Control Date: August 16, 2017

"ATTACHMENT F

**BILLING INSTRUCTIONS FOR
TIME-AND-MATERIALS/LABOR-HOUR TYPE CONTRACTS (AUG 2017)**

General: During performance and through final payment of this contract, the contractor is responsible for the accuracy and completeness of data within the System for Award Management (SAM) database and the Invoice Processing Platform (IPP) system and for any liability resulting from the Government's reliance on inaccurate or incomplete SAM and/or IPP data.

The contractor shall prepare invoices/vouchers for payment of deliverables identified in the contract, in the manner described herein. FAILURE TO SUBMIT INVOICES/VOUCHERS IN ACCORDANCE WITH THESE INSTRUCTIONS MAY RESULT IN REJECTION OF THE INVOICE/VOUCHER AS IMPROPER.

Electronic Invoice/Voucher Submissions: Invoices/vouchers shall be submitted electronically to the U.S. Nuclear Regulatory Commission (NRC) is through the Invoice Processing Platform (IPP) at www.ipp.gov.

Purchase of Capital Property: *(\$50,000 or more with life of one year or longer)*

Contractors must report to the Contracting Officer, electronically, any capital property acquired with contract funds having an initial cost of \$50,000 or more, in accordance with procedures set forth in NRC [Management Directive \(MD\) 11.1](#), NRC Acquisition of Supplies and Services.

Agency Payment Office: Payment will be made by the office designated in the contract in Block 12 of the Standard Form 26, or Block 25 of the Standard Form 33, whichever is applicable.

Frequency: The contractor shall submit claims for reimbursement once each month, unless otherwise authorized by the Contracting Officer.

Supporting Documentation: Any supporting documentation required to substantiate the amount billed shall be included as an attachment to the invoice created in IPP. If the necessary supporting documentation is not included, the invoice will be rejected.

Task Order Contracts: The contractor must submit a separate invoice/voucher for each individual task order with detailed cost information included as Supporting Documentation. This includes all applicable cost elements and other items discussed in paragraphs (a) through (j) of the attached instructions.

Billing of Costs after Expiration of Contract: If costs are incurred during the contract period and claimed after the contract has expired, you must cite the period during which these costs were incurred. To be considered a proper expiration invoice/voucher, the contractor shall clearly mark it "EXPIRATION INVOICE" or "EXPIRATION VOUCHER".

Final invoices/vouchers shall be marked "FINAL INVOICE" or "FINAL VOUCHER".

Currency: Invoices/Vouchers must be expressed in U.S. Dollars.

Supersession: These instructions supersede previous Billing Instructions for Time-and-Materials/Labor-Hour Type Contracts (JAN 2015).

Does my company need to register in IPP?

If your company is currently registered in IPP and doing business with other Federal Agencies in IPP, you will not be required to re-register.

If your company is not currently registered in IPP, please note the following:

- You will be receiving an invitation to register for IPP from IPP Customer Support, STLS.IPPHELPDESK@stls.frb.org.
- IPP Customer Support will send you two emails: the first email will contain the initial administrative IPP User ID and the second email, sent within 24 hours of receipt of the first email, will contain a temporary password.
- Please add the Customer Support email address (STLS.IPPHELPDESK@stls.frb.org) to your address book so you do not disregard these emails or mistake them for spam.

- During registration, one initial administrative user account will be created for your company and this user will be responsible for setting up all other user accounts including other administrators.
- Registration is complete when the initial administrative user logs into the IPP web site with the User ID and password provided by Treasury and accepts the rules of behavior.

What type of is training provided?

Vendor training materials, including a first time login tutorial, user guides, a [quick reference guide](#), and [frequently asked questions](#) are available on Treasury's IPP [website](#). **Individuals within your company responsible for submitting invoices should review these materials before work begins on the contract.**

How do I receive assistance with IPP?

Treasury's IPP Customer Support team provides vendor assistance related to the IPP application, and is also available to assist IPP users and to answer any questions related to accessing IPP or completing the registration process. IPP application support is also available via phone at (866) 973-3131, Monday through Friday from 8:00 am to 6:00 pm ET, and via email at IPPCustomerSupport@fiscal.treasury.gov.

Specific questions regarding your contract or task order should be directed to the appropriate NRC Contracting Officer.

INVOICE/VOUCHER FOR PURCHASES AND SERVICES OTHER THAN PERSONAL

(SAMPLE FORMAT – INVOICE ATTACHMENT)

- a. Billing period. Insert the beginning and ending dates (day, month, year) of the period during which costs were incurred and for which reimbursement is requested.
- b. Labor Hours Expended. Provide a general summary description of the services performed and associated labor hours utilized during the invoice period. Specify the Contract Line Item Number (CLIN) or SubCLIN, as applicable, and information pertaining to the contract's labor categories/positions, and corresponding authorized hours.
- c. Property. For contractor acquired property, list each item with an initial acquisition cost of \$50,000 or more and provide: (1) an item description, (2) manufacturer, (3) model number, (4) serial number, (5) acquisition cost, (6) date of purchase, and (7) a copy of the purchasing document.
- d. Shipping. Insert weight and zone of shipment, if shipped by parcel post.
- e. Charges for freight or express shipments. Attach prepaid bill if shipped by freight or express.
- f. Instructions. Include instructions to consignee to notify the Contracting Officer of receipt of shipment.
- g. Direct Costs. Insert the amount billed for the following cost elements, adjustments, suspensions, and total amounts, for both the current billing period and for the cumulative period (from contract inception to end date of this billing period).
 1. Direct (Burdened) Labor. This consists of salaries and wages paid (or accrued) for direct performance of the contract itemized, including a burden (or load) for indirect costs (i.e., fringe, overhead, General and Administrative, as applicable), and profit component, as follows:

Labor	Hours	Burdened		Cumulative
<u>Category</u>	<u>Billed</u>	<u>Hourly Rate</u>	<u>Total</u>	<u>Hours Billed</u>

2. Contractor-acquired property (\$50,000 or more). List each item costing \$50,000 or more and having a life expectancy of more than one year. List only those items of equipment for which reimbursement is requested. For each such item, list the following (as applicable): (a) an item description, (b) manufacturer, (c) model number, (d) serial number, (e) acquisition cost, (f) date of purchase, and (g) a copy of the purchasing document.

3. Contractor-acquired property (under \$50,000), Materials, and Supplies. These are equipment other than that described in (2) above, plus consumable materials and supplies. List by category. List items valued at \$1,000 or more separately. Provide the item number for each piece of equipment valued at \$1,000 or more.
4. Materials Handling Fee. Indirect costs allocated to direct materials in accordance the contractor's usual accounting procedures.
5. Consultant Fee. The supporting information must include the name, hourly or daily rate of the consultant, and reference the NRC approval (if not specifically approved in the original contract).
6. Travel. Total costs associated with each trip must be shown in the following format:

<u>Start Date</u>		<u>Destination</u>		<u>Costs</u>
From	To	From	To	\$

(Must include separate detailed costs for airfare, per diem, and other transportation expenses. All costs must be adequately supported by copies of receipts or other documentation.)

7. Subcontracts. Include separate detailed breakdown of all costs paid to approved subcontractors during the billing period.
- h. Total Amount Billed. Insert columns for total amounts for the current and cumulative periods.
- i. Adjustments. Insert columns for any adjustments, including outstanding suspensions for unsupported or unauthorized hours or costs, for the current and cumulative periods.
- j. Grand Totals.

3. Sample Invoice/Voucher Information (to be included as an attachment)

Sample Invoice/Voucher Information (Supporting Documentation must be attached)

This invoice/voucher represents reimbursable costs for the billing period from _____ through _____.

		<u>Amount Billed</u>	
		<u>Current Period</u>	<u>Cumulative</u>
(a)	<u>Direct Costs</u>		
(1)	Direct burdened labor	\$ _____	\$ _____
(2)	Government property (\$50,000 or more)	\$ _____	\$ _____
(3)	Government property, Materials, and Supplies (under \$50,000 per item)	\$ _____	\$ _____
(4)	Materials Handling Fee	\$ _____	\$ _____
(5)	Consultants Fee	\$ _____	\$ _____
(6)	Travel	\$ _____	\$ _____
(7)	Subcontracts	\$ _____	\$ _____
	Total Direct Costs:	\$ _____	\$ _____
(b)	Total Amount Billed	\$ _____	\$ _____
(c)	Adjustments (+/-)	\$ _____	\$ _____
(d)	Grand Total	\$ _____	\$ _____

(The invoice/voucher format provided above must include information similar to that included below in the following to ensure accuracy and completeness.)

SAMPLE SUPPORTING INFORMATION

The budget information provided below is for format purposes only and is illustrative.

Cost Elements:

1) Direct Burdened Labor - \$4,800

Labor	Hours	Burdened		Cumulative
<u>Category</u>	<u>Billed</u>	<u>Rate</u>	<u>Total</u>	<u>Hours Billed</u>
Senior Engineer I	100	\$28.00	\$2,800	975
Engineer	50	\$20.00	\$1,000	465
Computer Analyst	100	\$10.00	<u>\$1,000</u>	<u>320</u>
			\$4,800	1,760 hrs.

Burdened labor rates must come directly from the contract.

2) Government-furnished and contractor-acquired property (\$50,000 or more) - \$60,000

Prototype Spectrometer - item number 1000-01 = \$60,000

3) Government-furnished and contractor-acquired property (under \$50,000), Materials, and Supplies - \$2,000

10 Radon tubes @ \$110.00 = \$1,100

6 Pairs Electrostatic gloves @ \$150.00 = \$ 900

\$2,000

4) Materials Handling Fee - \$40

(2% of \$2,000 in item #3)

5) Consultants' Fee - \$100

Dr. Carney - 1 hour fully-burdened @ \$100 = \$100

6) Travel - \$2,640

(i) Airfare: (2 Roundtrip trips for 1 person @ \$300 per r/t ticket)

<u>Start Date</u>	<u>End Date</u>	<u>Days</u>	<u>From</u>	<u>To</u>	<u>Cost</u>
4/1/2011	4/7/2011	7	Philadelphia, PA	Wash, D.C.	\$300
7/1/2011	7/8/2011	8	Philadelphia, PA	Wash, D.C.	\$300

(ii) Per Diem: \$136/day x 15 days = \$2,040

7) Subcontracting - \$30,000

Company A = \$10,000

Company B = \$20,000

\$30,000

(EX: Subcontracts for Companies A & B were consented to by the Contracting Officer by letter dated 6/15/2011.)

Total Amount Billed \$99,580

Adjustments (+/-) - 0

Grand Total \$99,580

4. Definitions

Material handling costs. When included as part of material costs, material handling costs shall include only costs clearly excluded from the labor-hour rate. Material handling costs may include all appropriate indirect costs allocated to direct materials in accordance with the contractor's usual accounting procedures.”

All other terms and conditions remain the same.

[End of M0012]