

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE PAGE OF PAGES
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2. AMENDMENT/MODIFICATION NO. A223	3. EFFECTIVE DATE See block 16C	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
6. ISSUED BY CODE U.S. Department of Energy Brookhaven Site Office 53 Bell Avenue, Building 464 Upton, NY 11974-5000		7. ADMINISTERED BY (If other than Item 6) Code	

8. NAME AND ADDRESS OF CONTRACTOR (No. street, county, State and ZIP Code) Brookhaven Science Associates, LLC 25 Brookhaven Avenue Building 460 Upton, New York 11973-5000	<input checked="" type="checkbox"/>	9.A. AMENDMENT OF SOLICITATION NO.
		9.B. DATED (SEE ITEM 11)
	<input checked="" type="checkbox"/>	10.A. MODIFICATION OF Contract/Order NO. DE-AC02-98CH10886
CODE N/A FACILITY CODE N/A		10.B. DATED (SEE ITEM 13) 01/05/1998

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)

All required accounting and appropriations data are included in the attached financial worksheet and Section C.6 of the contract.

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

<input type="checkbox"/>	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.
<input type="checkbox"/>	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).
<input type="checkbox"/>	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
<input checked="" type="checkbox"/>	D. OTHER (Specify type of modification and authority) Mutual agreement of the parties

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 heading, including solicitation/contract subject matter where feasible.)

This Modification is issued to obligate American Recovery and Reinvestment Act of 2009 funds in the amount of \$19,781,000 under Treasury Accounting Symbol 89-09/10-0227. As a result, Section C.6, "Recovery Act Projects" has been amended to revise Attachment A of Work Authorization to Nuclear Physics – PHENIX Silicon Vertex MIE, revise the Statement of Work of Nuclear Physics – Enhanced Utilization of Isotope Facilities, add a new Nuclear Physics Project entitled Nuclear Science Workforce, and to obligate balance of funding for Science Laboratories Infrastructure (SLI) – Interdisciplinary Science Building (ISB).

Furthermore, revise Clause I.104, "Obligation of Funds."

15A. NAME AND TITLE OF SIGNER (Type or print) John Hauser Chief Financial Officer	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Evelyn Landini Contracting Officer
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15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
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(Signature of person authorized to sign) **9/21/09**

BY 
(Signature of Contracting Officer) **9/21/09**

Said contract, as modified previously, is hereby further modified as follows:

1. **Section C.6, Recovery Act Projects:** Replace the first page of this section with the revised attached page which adds a project to Category 4 Recovery Act projects for Nuclear Physics entitled "Nuclear Science Workforce."
2. **Section C.6.2, Recovery Act Projects Category 2:** Replace the pages of this Section with the attached revised pages which obligates the balance of funding for Science Laboratories Infrastructure (SLI) – Interdisciplinary Science Building (ISB).
3. **Section C.6.4, Recovery Act Projects Category 4:** Replace the pages of this Section with the attached revised pages which revise Attachment A to the Work Authorization to Nuclear Physics Project entitled PHENIX Silicon Vertex MIE, revises the Statement of Work of Nuclear Physics – Enhanced Utilization of Isotope Facilities, and adds Project 5 entitled Nuclear Science Workforce.
4. **Clause I.104 - OBLIGATION OF FUNDS:** The first sentence of paragraph (a) is revised to read as follows: "The amount presently obligated by the Government with respect to this Contract is **\$5,737,073,999.82.**"
5. The following is a history of the change in the obligated amount since the last Modification that updated Clause I.104.

PRIOR OBLIGATION A222	\$ 5,717,292,999.82
INCREASE IN MOD A223 ARRA	<u>\$ 19,781,000.00</u>
CURRENT TOTAL OBLIGATION:	\$ 5,737,073,999.82

Attachments:

Financial Worksheet

Section C.6

- Section C.6.2 – Science Laboratories Infrastructure (SLI) – Interdisciplinary Science Building (ISB)
- Section C.6.4 – Nuclear Physics – PHENIX Silicon Vertex MIE
- Section C.6.4 – Nuclear Physics – Enhanced Utilization of Isotope Facilities
- Section C.6.4 – Nuclear Physics – Nuclear Science Workforce

C.6 – RECOVERY ACT PROJECTS

This section is created to identify individual Recovery Act Projects as follows:

1. Recovery Act Project Category 1: Basic Energy Sciences (BES)
 - National Synchrotron Light Source II (NSLS-II)
 - Nanoscale Science Research Centers
 - Light Source Improvements

2. Recovery Act Project Category 2: Science Laboratories Infrastructure (SLI)
 - Roofing
 - Mechanical & Electrical Upgrades
 - Chemistry Bldg Fire Safety Corrections
 - Interdisciplinary Science Building

3. Recovery Act Project Category 3: Environmental Management (EM)
 - Accelerated Cleanup of Surplus Nuclear Facilities

4. Recovery Act Project Category 4: Nuclear Physics (NP)
 - PHENIX Silicon Vertex MIE
 - PHENIX Forward Vertex Detector MIE
 - Enhanced AIP Funding at NP User Facilities
 - Enhanced Utilization of Isotope Facilities
 - Nuclear Science Workforce

5. Recovery Act Project Category 5: Energy Efficiency and Renewable Energy (EERE)
 - Federal Lab Support for Recovery Act Transactions ARRA FY09

6. Recovery Act Project Category 6: High Energy Physics (HEP)
 - Advanced Technology R&D Augmentation
 - Long Baseline Neutrino Experiment

7. Recovery Act Project Category 7: Advanced Projects Research Agency - Energy (ARPA-E)
 - Brookhaven National Laboratory (BNL) - Reviewer for ARPA-E

**C.6.2 – Recovery Act Project Category 2:
Science Laboratories Infrastructure (SLI)**

- A. This modification increases the obligation of American Recovery and Reinvestment Act of 2009 funds by \$17,973,000.00 from \$19,200,000.00 to a revised total of \$37,173,000.00. The increased obligation is for the SLI ISB project. The value of each project is indicated separately below.
- B. Clause I.104 DEAR 970.5232-4 “Obligation of Funds” has been adjusted accordingly.
- C. The specific work funded by this modification is as follows:

Science Laboratories Infrastructure - General Plant Projects (GPP)

Statement of Work

1. Mission Critical Building Roofing (\$5.5M + \$3.5M = revised TEC \$9.0M)

These funds are provided under KG09; this project will re-roof several Mission Critical science and utility buildings. The buildings include Medical (490), Physics (510), Instrumentation (535), Light Source (725), Collider-Accelerator (several buildings), Firehouse (599), and Water Plant (624).

2. Mission Critical Building Mechanical & Electrical Upgrades (\$5.4M + \$1.6M = Revised TEC \$7.0M)

These funds are provided under KG09; this project will upgrade the HVAC in portions of several Mission Critical buildings used by BNL's science programs. Included will be the replacement of worn-out air handlers and the removal and replacement of highly flammable polystyrene duct insulation to reduce potential fire hazards. Aged and overdutied electrical equipment will be replaced. In addition, several elevators will also be rehabilitated and brought up to current standards. The buildings are all Mission Critical and include Biology (463), Physics (510), Central Scientific Computing (515) Instrumentation/NSLS (535), Chemistry (555), and Isotope Research (801).

3. Chemistry, Bldg 555, Fire Safety Corrections (unchanged TEC \$2.5M)

These funds are provided under KG09; the Mission Critical Chemistry building, B/555, will have fire barrier established around required building fire zones, vertical fire separations will be provided, and automatic fire sprinklers will be provided throughout the unsprinklered 2/3 of the building.

The specific Contractor Recovery Act Statement of Work, Milestones, Outcomes and Measures, and Deliverables funded by this modification are identified in the following referenced Work Authorization:

Work Authorization Number	Work Authorization Title
KG/CH13/9 Project Code 2005380	Science Laboratories Infrastructure - General Plant Projects (GPP)

<u>Science Laboratories Infrastructure - SLI Construction, Interdisciplinary Science Building (ISB)</u>	
<u>Statement of Work</u>	
<p>1. <u>Interdisciplinary Science Building (ISB), Phase I (\$0.7M + \$17.973M = Revised TEC \$18.673M)</u></p> <p>These funds are provided under KG01, the project will begin site clearing work at the ISB-Phase I.</p> <p>Rev 02 to this Work Authorization obligates the balance of funding for Line item construction project 09-SC-73, Interdisciplinary Science Building – Phase I.</p> <p><i>The specific Contractor Recovery Act Statement of Work, Milestones, Outcomes and Measures, and Deliverables funded by this modification are identified in the following referenced Work Authorization:</i></p>	
Work Authorization Number	Work Authorization Title
KG/CH13/9/ARRA-4 and Rev 02 Project Code 2005370	Science Laboratories Infrastructure - SLI Construction, Interdisciplinary Science Building (ISB), Ph.I

- D. The work described in this modification shall be performed using funds obligated under this contract, which have been appropriated under the Recovery Act of 2009, Pub. L. 111-5, and as such, is subject to the special statutory conditions and the additional contractual terms and conditions that are listed in paragraph E below and the changes made to Sections E and G of the contract pertaining to the Recovery Act. The funds obligated hereunder shall only be used to accomplish the work as set forth in paragraph C. above and may not be used for any other purpose without the prior written consent of the Contracting Officer.
- E. The Contractor shall complete all Recovery Act Work funded by this modification in accordance with Recovery Act requirements, including the required completion dates specified therein, and by the completion date identified in the approved work authorization for the activity.

Note: Paragraph F pertains to the ISB, Ph.I project only.

- F. ACCELERATED WORK: The Contractor shall submit to the CO a revised project baseline that clearly identifies the changes to the baseline due to the acceleration of work to include a detailed description of accelerated work, a budget of estimated costs for the accelerated work, and a schedule for the performance of this work within 60 days of this modification.

**C.6.4 – Recovery Act Project Category 4:
 Nuclear Physics (NP)**

- A. This modification increases the obligation of American Recovery and Reinvestment Act of 2009 funds by \$1,808,000.00 from \$10,758,000.00 to a revised total of \$12,566,000.00. This modification also revises Attachment A of Work Authorization to PHENIX Silicon Vertex MIE, revises the Statement of Work to Enhanced Utilization of Isotope Facilities, and adds a new project entitled “Nuclear Science Workforce.” The value of each project is indicated separately below.
- B. Clause I.104 DEAR 970.5232-4 “Obligation of Funds” has been adjusted accordingly.
- C. The specific work funded by this modification is as follows:

<p>1. <u>PHENIX Silicon Vertex MIE (\$0.225M + \$.025M = revised TEC \$.250M)</u></p> <p>Statement of Work: These funds are provided under KB-02-01-02-1 EQU to advance funding for equipment purchases for the PHENIX Silicon Vertex Tracker MIE (71RD) project, including data acquisition crates for front-end modules for strip detectors; data collection modules, and installation fixtures and external cooling system.</p> <p>Per Work Authorization, Rev 02, Attachment A, Contractor Recovery Act Performance Requirements, has been revised.</p> <p><i>The specific Contractor Recovery Act Statement of Work, Milestones, Outcomes and Measures, and Deliverables funded by this modification are identified in the following referenced Work Authorization:</i></p>	
Work Authorization Number	Work Authorization Title
KB/CH13/9/ARRA-1 and Rev 01 and Rev 02 Project Code 2005200	Nuclear Physics - PHENIX Silicon Vertex MIE

<p>2. <u>PHENIX Forward Vertex Detector MIE (\$.767M + \$.2M = revised TEC \$.967M)</u></p> <p>Statement of Work: These funds are provided under KB-02-01-02-1 EQU to advance funding for the purchasing of two silicon endcaps for the PHENIX Forward Vertex Detector MIE (81SF)</p> <p><i>The specific Contractor Recovery Act Statement of Work, Milestones, Outcomes and Measures, and Deliverables funded by this modification are identified in the following referenced Work Authorization:</i></p>	
Work Authorization Number	Work Authorization Title
KB/CH13/9/ARRA-2 and Rev 01 and Rev 02 Project Code 2005210	Nuclear Physics – PHENIX Forward Vertex Detector MIE

3. Enhanced AIP Funding at NP User Facilities (\$7.2M + \$.8M = revised TEC \$8M)

Statement of Work: These funds are provided under KB-02-02-01-1 for accelerated implementation of the stochastic cooling in both storage rings and implementation of electron lenses for RHIC.

The specific Contractor Recovery Act Statement of Work, Milestones, Outcomes and Measures, and Deliverables funded by this modification are identified in the following referenced Work Authorization:

Work Authorization Number	Work Authorization Title
KB/CH13/9/ARRA-3 and Rev 01 Project Code 2005220	Nuclear Physics – Enhanced AIP Funding at NP User Facilities

4. Enhanced Utilization of Isotope Facilities (\$.225M + \$1.316M = revised TEC \$1.541M)

Statement of Work: Original funds were provided under ST-60-01-03 for procuring and commissioning a new inductively coupled plasma (ICP) mass spectrometer. This funding will enhance isotope production and processing capabilities at BNL to enable the program to better meet the need for isotopes in short supply.

In addition, Rev 01 provides \$1,316,000 in OPE funding under ST-60-01-02 for:

- FWP #2009-BNL-MO086 for the “Development of Zn-68 targets for improved yields and production of Cu-67” (\$724,000). The PI is Leonard Mausner. The project period is October 2009 – October 2011.
- FWP #2009-BNL-MO087 for the “Development of large scale production of PET isotope Yttrium-86 at Brookhaven Linac Isotope Production” (\$592,000). The PI is Dmitri G. Medvedev. The project period is October 2009 – October 2011.

The specific Contractor Recovery Act Statement of Work, Milestones, Outcomes and Measures, and Deliverables funded by this modification are identified in the following referenced Work Authorization:

Work Authorization Number	Work Authorization Title
ST/CH13/9/ARRA-4 and Rev 01 Project Code 2005230	Nuclear Physics – Enhanced Utilization of Isotope Facilities

5. Nuclear Science Workforce (\$1.808M)

Statement of Work: These funds (\$1.4M) are provided under KB-03-01-04-2 for FWP#22675 entitled "Neutron Cross Section Covariances for the ENDF/B-VII Library." The Principal Investigator is Pavel Oblozinsky. The project period is 09/2009 to 09/2012.

These funds (\$.408M) are provided under KB-04-01-02-2 for FWP#22555 entitled, "Use of Covariances in a Consistent Data Assimilation for Improvement of Basic Nuclear Parameters in Nuclear Reactor Applications: From Meters to Femtometers." The Principal Investigator is Michael Herman. The project period is 10/2009 to 09/2012.

The specific Contractor Recovery Act Statement of Work, Milestones, Outcomes and Measures, and Deliverables funded by this modification are identified in the following referenced Work Authorization:

Work Authorization Number	Work Authorization Title
KB/CH13/9/ARRA-5 Project Code 2005270	Nuclear Physics – Nuclear Science Workforce

- D. The work described in this modification shall be performed using funds obligated under this contract, which have been appropriated under the Recovery Act of 2009, Pub. L. 111-5, and as such, is subject to the special statutory conditions and the additional contractual terms and conditions that are listed in paragraph E below and the changes made to Sections E and G of the contract pertaining to the Recovery Act. The funds obligated hereunder shall only be used to accomplish the work as set forth in paragraph C. above and may not be used for any other purpose without the prior written consent of the Contracting Officer.

- E. The Contractor shall complete all Recovery Act Work funded by this modification in accordance with Recovery Act requirements, including the required completion dates specified therein, and by the completion date identified in the approved work authorization for the activity.