

<b>AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT</b>		1. CONTRACT ID CODE	PAGE OF PAGES 1   2
2. AMENDMENT/MODIFICATION NO. 0457	3. EFFECTIVE DATE See Block 16C	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
6. ISSUED BY Idaho Operations Office Idaho Operations U.S. Department of Energy Idaho Operations Idaho Falls ID 89415	CODE 892432	7. ADMINISTERED BY (If other than Item 6) Idaho Operations U.S. Department of Energy Idaho Operations 1955 Fremont Avenue MS 1221 Idaho Falls ID 83415	CODE 00701
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) BATTELLE ENERGY ALLIANCE, LLC Attn: Adam Andersen P.O. BOX 1625 IDAHO FALLS ID 83415		(x)	9A. AMENDMENT OF SOLICITATION NO.
CODE 152020629		FACILITY CODE	9B. DATED (SEE ITEM 11)
		x	10A. MODIFICATION OF CONTRACT/ORDER NO. DE-AC07-05ID14517
			10B. DATED (SEE ITEM 13) 11/09/2004

**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 electronic communication 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 letter or electronic communication, provided each letter or electronic communication 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)

**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 data, 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) FAR 43.103(a) and DEAR 970.5215-1

**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.)


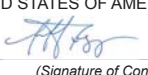
DUNS Number: 152020629

The purpose of this modification is to incorporate changes to Section J, Attachment K, Fiscal Year (FY) 2020 Performance Evaluation and Measurement Plan (PEMP), Notable Outcomes, due to the impact of COVID-19.

All other terms and conditions remain 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) Adam D. Andersen, BEA Contracting Officer		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Jeffrey C. Fogg	
15B. CONTRACTOR/OFFEROR  Digitally signed by Andersen, Adam D (ANDEAD) Date: 2020.08.03 15:22:49 -06'00'	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA  Digitally signed by Jeffrey C. Fogg Date: 2020.08.03 15:26:50 -06'00'	16C. DATE SIGNED 08/03/2020

Previous edition unusable

**CONTINUATION SHEET**

REFERENCE NO. OF DOCUMENT BEING CONTINUED  
DE-AC07-05ID14517/0457

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NAME OF OFFEROR OR CONTRACTOR  
BATTELLE ENERGY ALLIANCE, LLC

ITEM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
	Payment: OR for Idaho U.S. Department of Energy Oak Ridge Financial Service Center P.O. Box 6017 Oak Ridge TN 37831 Period of Performance: 11/09/2004 to 09/30/2024				

## INFORMATION PAGES MODIFICATIONS

The purpose of this modification is to incorporate the following changes made to Section J, Attachment K, *Fiscal Year (FY) 2020 Performance Evaluation and Measurement Plan (PEMP)*, Notable Outcomes.

### **Notable Outcome 1.1.B – Advanced Fuel**

Develop and fabricate the first FAST (Fission Accelerated Steady-state Test) experiment for insertion into the Advanced Test Reactor (ATR). The objective of the experiment is a first ever demonstration of an innovative approach to greatly increasing the rate of burnup accumulation in semi-integral fuel rodlets to accelerate the most time-consuming component of the development and qualification cycle for new nuclear fuels. Designated as FAST-1, the experiment will be developed to test a variety of advanced design features in the metallic fuel system, including: 1) sodium-free, annular fuel geometry, 2) fuel additives for lanthanide fission product control, and 3) cladding liners as diffusion barriers against fuel-cladding chemical interaction. Significant challenges to overcome include approval of a new experiment design for ATR and development of new fabrication methods for highly enriched, miniaturized fuel rodlets. FAST-1 is planned for insertion in ATR Cycle 168B, ~~expected to begin on or before July 31~~ 169A in early FY21, so fabrication and assembly will be completed and the experiment approved for ATR insertion by September 30, 2020.

### **Notable Outcome 1.1.D – ~~Micro-reactors~~ Microreactors**

~~Complete~~ In preparation for performing the first non-nuclear microreactor ~~micro-reactor~~ test bed thermal test, complete: 1) fabrication and installation of major components and piping representing microreactor systems and 2) fabrication of a test article with integrated heat pipe(s) and structural core. This includes completing fabrication and installation of the major microreactor ~~micro-reactor~~ testbed components, design and fabrication of the test-article components to include a section of a microreactor ~~micro-reactor~~ structural core block, integration of electrical heating elements, integration of a heat pipe(s) with the structural block section, ~~installing in test bed and performing~~ fabrication of the first test of thermal heating of the integrated heat source, core block section, and heat pipes ~~test article~~.

### **Notable Outcome 1.1.G – Transient Testing (Experiment Outcome)**

Support the development, testing, and qualification of advanced fuel designs and metallic fuel behaviors, including transient effects in both integral and separate effects experiments. Specifically:

- Complete the Minimum Activation Retrievable Capsule Holder (MARCH)-Static Environment Rodlet Transient Testing Apparatus (SERTTA) test commissioning campaign (ATF-RIA-1-A through ATF-RIA-1-~~DE~~) to validate simulations of the design basis accident, reactivity insertion accidents (RIA), testing in fuel samples during

Transient Reactor Test (TREAT) irradiations and qualification of critical in-situ instruments.

- Prepare the first Accident Tolerant Fuels (ATF) experiment using ~~Demonstrate the capability to prepare~~ pre-irradiated fuel specimens ~~rods for irradiation testing in either TREAT. Complete remote assembly in HFEF of the MARCH-SERTTA or MARCH-Separate Effects Test Holder (SETH) capsule containing a dummy Accident Tolerant Fuel (ATF) rod, which represents the first experimental activity of this type to be tested executed at TREAT-INL in nearly 30 years.~~

### Notable Outcome 1.3.A – Biomass

- None.

~~INL is facilitating BETO's mission of creating a sustainable energy future with renewable biomass resources by developing breakthrough bioconversion strategies and technologies to increase the success of commercial operational scale up through implementation of Process Demonstration Unit (PDU) 2 improvements. INL researchers are investigating fundamental fractionation in three key areas: (1) new systems and functions for fractionation, (2) innovative methods to define and preserve the critical material attributes and identify the fracture mechanism of feedstock fractions under impact and shear, and (3) properties and behaviors of feedstock fractions and formats to understand and improve the material flow and downstream conversion performance.~~

~~Expected accomplishments in FY20 include:~~

- ~~Install and integrate fractional deconstruction and separation equipment providing unique capabilities for the advancement of the Biomass Feedstock National User Facility (BFNUF) to produce high fidelity fractions/tissues for conversion ready feedstocks~~
- ~~Advance the scientific principles of separation and fractionation of biomass tissue/formats and develop physics based models for flow performance~~
- ~~Demonstrate small scale fractionation of forest residues with defined critical material attributes for conversion performance in support of BETO's FY22 verification~~

~~INL will prepare and submit at least four papers for publication in distinguished scientific journals. The papers will relate to post-harvest management, material handling, and/or advanced fractionation. At least two of the papers will be accepted for publication by September 30, 2020.~~

NOTE: Other minor clean-up clerical revisions are included in Section J, Attachment K.