



## Department of Energy

Oak Ridge Office  
P.O. Box 2001  
Oak Ridge, Tennessee 37831—

July 23, 2009

Mr. Michael J. Fietze, Director  
Prime Contract Administration  
UT-Battelle, LLC  
P.O. Box 2008  
Oak Ridge, TN 37831-6262

Dear Mr. Fietze:

### **CONTRACT NO. DE-AC05-00OR22725 - MODIFICATION NO. 229**

A fully executed copy of the subject contract modification is enclosed for your retention. This modification obligates American Recovery and Reinvestment Act of 2009 funding in the amount of \$144,000 to the contract for the project entitled "Fusion Energy Sciences – DIII-D Facility Upgrades (2005290)".

If you have any questions, please contact me at 576-4523.

Sincerely,

A handwritten signature in black ink that reads "Mark A. Million".

Mark A. Million  
Contracting Officer

Enclosure

<b>AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT</b>		1. CONTRACT ID CODE	PAGE OF PAGES 1   3
2. AMENDMENT/MODIFICATION NO. 229	3. EFFECTIVE DATE See Block 16C	4. REQUISITION/PURCHASE REQ. NO. 09SC005491	5. PROJECT NO. (if applicable)
6. ISSUED BY Oak Ridge U.S. Department of Energy P.O. Box 2001 Oak Ridge TN 37831	CODE 00518	7. ADMINISTERED BY (if other than Item 6) Oak Ridge U.S. Department of Energy P.O. Box 2001 Oak Ridge TN 37831	CODE 00518
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) UT-BATTELLE, LLC Attn: Michael J. Freitze, Director Prime Contract Administration Post Office Box 2008 OAK RIDGE TN 37831-6231		(x) 9A. AMENDMENT OF SOLICITATION NO.	9B. DATED (SEE ITEM 11)
CODE 099114287	FACILITY CODE	X 10A. MODIFICATION OF CONTRACT/ORDER NO. DE-AC05-00OR22725	10B. DATED (SEE ITEM 11) 10/18/1999

**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)  
See Page 3. Net Increase: \$144,000.00

**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) Clause I.143, P.L. 95-91, and P.L. 111-5

E. IMPORTANT: Contractor  is not,  is required to sign this document and return \_\_\_\_\_ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

Subj to Retent: N

Recovery TAS::89 0227::TAS

See Page 3.

Note: Information reflected on Page 2 is not relevant to this modification and may not be accurate. Please disregard Page 2.

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) Mark A. Million		
15B. CONTRACTOR/OFFEROR  (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA  Mark A. Million (Signature of Contracting Officer)	16C. DATE SIGNED 7/23/09

**CONTINUATION SHEET**

REFERENCE NO. OF DOCUMENT BEING CONTINUED  
DE-AC05-000R22725/229

PAGE OF  
2 3

NAME OF OFFEROR OR CONTRACTOR  
UT-BATTELLE, LLC

ITEM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
00001	FOB: Destination Period of Performance: 04/01/2000 to 03/31/2010  Change Item 00001 to read as follows (amount shown is the total amount):  Recovery TAS::89 0227::TAS - MANAGEMENT AND OPERATION OF THE OAK RIDGE NATIONAL LABORATORY - Project Entitled "Fusion Energy Sciences - DIII-D Facility Upgrades (2005290)" Incrementally Funded Amount: \$9,122,134,917.97				

**Block 12 “ACCOUNTING AND APPROPRIATIONS DATA,” continued.**

**Funds Obligated for Recovery Act Projects:**

All required accounting and appropriations data, including the Treasury Accounting Symbol and Fund Code is hereby provided as Attachment 2 to this modification.

**Block 14 “DESCRIPTION OF AMENDMENT/MODIFICATION,” continued.**

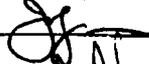
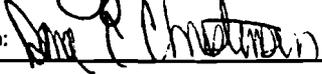
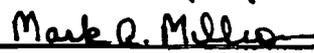
- A. This modification is issued to obligate American Recovery and Reinvestment Act (Recovery Act) of 2009 funds for the project entitled “Fusion Energy Sciences – DIII-D Facility Upgrades (2005290)”.
- B. Accordingly, pursuant to Section I Contract Clause – DEAR 970.5232-4 entitled “Obligation of Funds,” additional funds in the amount of \$144,000 are hereby obligated in support of Recovery Act activities. The total amount of funds obligated under this contract since its inception is increased from \$9,513,338,839.60 to \$9,513,482,839.60.
- C. 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(s):

<b>Work Authorization Number</b>	<b>Work Authorization Title</b>
WA No. AT/OR41/9/ARRA-1 (Attachment 1)	Fusion Energy Sciences – DIII-D Facility Upgrades (2005290)
(Number from Block 8 of the Work Authorization)	

- 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 section E below and previous contract modifications related to the Recovery Act. The funds obligated hereunder shall only be used to accomplish the work as set forth in section 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.
- F. All other terms and conditions remain unchanged.

<b>U.S. DEPARTMENT OF ENERGY</b> <b>CONTRACT WORK AUTHORIZATION</b> <b>AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009: 89-09/10-0227</b>		
1a. Project Title: Fusion Energy Sciences – DIII-D Facility Upgrades (2005290)		1b. Work Proposal Number (if applicable): Various
2. Headquarters Program Point of Contact: Name: Edmund Synakowski Organization Code: SC-24 Telephone No.: (301) 903-4941		
3. Headquarters Budget Point of Contact: Name: Karen Summers Organization Code: SC-41 Telephone No.: (301) 903-4947		
4. Responsible Program: Fusion Energy Sciences		5. Responsible Secretarial Officer: Under Secretary for Science
6. Responsible Field Organization: Oak Ridge Office		
7a. Site and Facility Management Contractor: UT-Battelle LLC (Oak Ridge National Laboratory)		7b. Contractor Point of Contact: Name: Donald Hillis Telephone No.: 865-576-3739
8. Work Authorization Number: AT/OR41/9/ARRA-1		9. Revision Number: 00
10. Funds Authorized (\$ in thousands). B&R Code: AT Previous: \$0 Change: \$+144 Current: \$144*		
11. Performance Period Covered by Funds. <del>MM</del> From: <del>02/17/09</del> 7/24/09 To: 09/30/10		12. Work Start Date: <del>MM</del> 6/2009- 7/2009
13. Expected Completion Date: 9/2011		
14. Statement of Work: see attached This Work Authorization is issued for the sole purpose of authorizing work in support of the American Recovery and Reinvestment Act of 2009, (Pub. L. 111-5) (Recovery Act). All contract terms and conditions apply to the work identified herein, in particular contract provision H.999 <sup>50</sup> applies. The work described in this work authorization shall be performed using funds obligated under the contract, appropriated under the Recovery Act and as such is subject to special statutory conditions. The Office of Science (SC) is committed to conducting all work authorized herein, in a manner that ensures protection of the workers, the public, and the environment. Protecting the workers, the public, and the environment is a direct and individual responsibility of all SC managers and SC-supported contractors. Funds provided by SC will be applied as necessary to ensure that all supported activities are conducted safely and in an environmentally conscientious manner. Only work conducted in this manner will be supported. <u>Specific Recovery Act Statement of Work:</u> \$144,000 is provided under AT5502 to hire a post-doc to install and implement a system that will image the edge magnetic topology on the DIII-D tokamak during the application of Resonant Magnetic Perturbations (RMP). RMPs are used to suppress Edge Localized Modes (ELMs) in DIII-D because the ELMs create undesirable pulsed heat loads to the divertor and wall structures. A realistic assessment of the impact of the applied 3-d magnetic fields requires modeling of the plasma response, which in some cases can shield the perturbation and in other cases amplify it. Assessment of the field in the plasma can be accomplished with an edge imaging system. The pedestal temperature typically lies in the 0.2 - 1.0 keV, which lies in the soft X-ray emission wavelength range. Thus the leading candidate to image the edge island structure would be from a soft X-ray pinhole camera. The primary task of the postdoc will be to lead the implementation of an edge imaging system to diagnose the edge island structure in the vicinity of the DIII-D X-point region. An additional \$36,000 is anticipated in a subsequent AFP following the risk assessment process, bringing the total to \$180,000. Attachment A, Contractor Recovery Act Performance Requirements, identifies the Contractor Recovery Act Schedule Milestones, Performance Measures and Outcomes and Deliverables for this Work Authorization. The contractor's performance against the identified requirements in Attachment A will be evaluated under the Office of Science laboratory appraisal process.		

Continuation - DIII-D Facility Upgrades (2005290) - ORNL  
AT/OR41/9/ARRA-1, Rev 00

15. Reporting Requirements (Status reports, scientific and technical information or similar): The recipient of funding in this Work Authorization is responsible for meeting all reporting requirements established by the Department of Energy for activities funded by the American Recovery and Reinvestment Act of 2009.		
16. Work Authorization Program Official. Name (typed): Edmund Synakowski	Signature: 	Date: 6/30/09
17. DOE Field Organization Official. Name (typed): Johnny Mason	Signature: 	Date: 7/14/09
18. Contractor's Authorized Representative. Name (typed): Dana C. Christensen	Signature: 	Date: 17 July 2009
19. DOE Contracting Officer (or delegated representative). Name (typed): MARK A. MILLION	Signature: 	Date: 7/14/09

\* Includes Operating of \$144,000.

**ATTACHMENT A – CONTRACTOR RECOVERY ACT PERFORMANCE REQUIREMENTS  
 DIII-D Facility Upgrades (2005290) – ORNL  
 AT/OR41/9/ARRA-I, Rev 00**

<p><b>Section A: <u>Contractor Recovery Act Schedule or Milestone Requirements</u></b></p>	
Secure a postdoc to focus on implementation of an edge magnetic topology imaging system	August 2009
Complete engineering design review of edge imaging system	February 2010
Install imaging system on DIII-D during the Long Torus Opening Activity	February 2011,
Commission edge imaging system with first plasma light	September 2011
<p><b>Section B: <u>Contractor Recovery Act Performance Outcomes and Measures</u></b></p>	
<p>Completed engineering design will be acceptable for implementation on the DIII-D tokamak</p>	
<p>Variation from total cost of effort will be less than 10%</p>	
<p>The task schedule will be coordinated and managed in conjunction with the planned DIII-D Long Torus Opening Activity (LTOA) such that this task does not delay the scheduled completion of the LTOA</p>	
<p>Initial data from the diagnostic will be reported at open science meetings and conferences</p>	
<p><b>Section C: <u>Contractor Recovery Act Deliverables</u></b></p>	
<p>The deliverable will be data taken to examine the edge island structure in the vicinity of the X-point in the DIII-D tokamak using an edge x-ray imaging system.</p>	

Financial Plan Number. 6  
 Contract Modification Number. 229  
 Rpt Entity: OR OR3/OR4 - Oak Ridge National Lab, X-10, UT-Battelle

Fiscal Year: 2009  
 Fiscal Month: 10

# Financial Plan Report - Detail

Site: OR

Page 1 of 1  
 Report: RFP0001

**OR22725 - UT-BATTELLE (RECOVERY ACT - 8909/100227)**

Report Generated on: July 22, 2009 at 07:24:03 AM

Rpt Entity	Fund Code	Leg FT	Program	Legacy B&R	Obj. Class	Local Use	Project	WFO	Legacy Order Number	Beginning Uncosted Obs	Previous	BA Change	Revised	Total Available
470002	06199	WO	2924133	39KG01000P	32001	0472988	2005370	0000000		0.00	60,568,000.00	0.00	60,568,000.00	60,568,000.00
<i>AY 2009 - Work Authorization Number KG/OR41/9; Appropriation Symbol: 8909/100227</i>														
<b>Total for Program Parent/Control Point: 39KG01000PRN08SC71000</b>										0.00	60,568,000.00	0.00	60,568,000.00	60,568,000.00
470002	06199	WO	2923627	AT5502000	25400	0000000	2005290	0000000		0.00	0.00	144,000.00	144,000.00	144,000.00
<i>AY 2009 - Work authorization number: AT/OR41/9/ARRA-1; Appropriation Symbol: 8909/100227</i>														
<b>Total for Program Parent/Control Point: AT0000000</b>										0.00	0.00	144,000.00	144,000.00	144,000.00
470002	06199	WO	2923755	KB0401022	31001	0470023	2005190	0000000		0.00	600,000.00	0.00	600,000.00	600,000.00
<i>AY 2009 - Work Authorization Number KB/OR41/9/ARRA-1; MIE 41NM; Appropriation Symbol: 8909/100227</i>														
470002	06199	WO	2924157	KB0402011	32003	0473116	2005220	0000000		0.00	2,250,000.00	0.00	2,250,000.00	2,250,000.00
<i>AY 2009 - KB/OR41/0/ARRA-2 Rev 00; Appropriation Symbol 8909/100227</i>														
<b>Total for Program Parent/Control Point: KB0000000</b>										0.00	2,850,000.00	0.00	2,850,000.00	2,850,000.00
470002	06199	WO	2924021	KC020401D	31003	0000000	2005040	0000000		0.00	5,785,000.00	0.00	5,785,000.00	5,785,000.00
<i>AY 2009 - Work Authorization Number KC/OR41/9/ARRA-1; Appropriation Symbol: 8909/100227</i>														
<b>Total for Program Parent/Control Point: KC0200000</b>										0.00	5,785,000.00	0.00	5,785,000.00	5,785,000.00
470002	06199	WO	2924024	KG0900000	32002	0473068	2005380	0000000		0.00	10,000,000.00	0.00	10,000,000.00	10,000,000.00
<i>AY 2009 - Work Authorization Number KG/OR41/9; Appropriation Symbol: 8909/100227</i>														
<b>Total for Program Parent/Control Point: KG0900000</b>										0.00	10,000,000.00	0.00	10,000,000.00	10,000,000.00
<b>Total for Fund Type: WO</b>										0.00	79,203,000.00	144,000.00	79,347,000.00	79,347,000.00
<b>Total for Recipient Code: OR</b>										0.00	79,203,000.00	144,000.00	79,347,000.00	79,347,000.00
<b>Total for Reporting Entity: 470002</b>														
<b>Total for OR22725 - UT-BATTELLE (RECOVERY ACT - 8909/100227)</b>										0.00	79,203,000.00	144,000.00	79,347,000.00	79,347,000.00

Attachment 2