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2. CONTRACT (Proc. Inst. Ident.) NO. HR0011-09-C-0028	3. EFFECTIVE DAT	02 Oct	2008		4. REQUIS X670/04 & X67	51 TON/PURC 0/08	HASE REQUEST/P		·O.
5. ISSUED BY COD	E HR0011		6. ADMI	VISTERED	BY (If other	than Item 5)	COD	E S2404A	
DARPA CMO ATTN: MICHAEL D. BLACKSTONE 3701 N. FAIRFAX DR. ARLINGTON VA 22203-1714			SUITE 200	INIA EVIEW PARKI VA 20109-2342					
7. NAME AND ADDRESS OF CONTRACTION O	CTOR (No., street, city,	county, state an	ıd zip code)		T	8. DELIVERY		THER (S	iee below)
510 HERNDON PKWY HERNDON VA 20170-5225					-		OR PROMPTPAYMEN		55 (76151)
HEANDON VA 20170-3223						net 30 days			
						10. SUBMIT INV		ITEM	
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CODE 8Y519	FACILITY CODE		r			SHOWN IN:	- COD	E LIDOSO	
11. SHIP TO/MARK FOR COD.	E N00039		12. PAY	MENT WILL UMBUS CENT	ILL BE MA TER	DE BY	COD	E HQ0338	
DR. FRANK HANSON SPAWARSYSC EN 56430 53490 DOW STREET SAN DIEGO CA 92152-5743			P.O. BOX 1: COLUMBU	S OH 43218-2	264				
13. AUTHORITY FOR USING OTHER T	THAN FULL AND OP	EN	14. ACC	OUNTING	AND APPI	ROPRIATION	DATA		
COMPETITION: [] 10 U.S.C. 2304(c)() []	41 U.S.C. 253(c)()	See Sc	hedule					
15A. ITEM NO. 15B. St	JPPLIES SERVICES		15C. QU	ANTITY	15D. UN	IT 1	5E. UNIT PRICE	15F.	AMOUNT
SEE S	SCHEDULE								
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X D PACKAGING AND MARKIN		8	1				ONS AND INSTRU	CTIONS	
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17. [X] CONTRACTOR'S NEGOTIATED AGREEMEN document and return] copies to issuing office.)	Ontractor is required to Contractor agrees to furnish and		18.[]A	WARD (Cont	ractor is not requ	ired to sign this doc	ument) Your offer o	n Solicitation N	umber
items or perform all the services set forth or otherwise id sheets for the consideration stated herein. The rights and contract shall be subject to and governed by the followin (b) the solicitation, if any, and (c) such provisions, repres as are attached or incorporated by reference herein.	entified above and on any contr obligations of the parties to this g documents: (a) this award/col	nuation ntract,	above, is he the contrac	reby accepted t which consist	as to the items li	sted above and on a	ns or changes are set forth in any continuation sheets. This e Government's solicitation decessary.	s award consun	
(Attachments are listed herein.) 19A. NAME AND TITLE OF SIGNER	(Type or print)		20A N	AME OF O	ONTRACT	ING OFFICER			
THE OF SECTION ASSESSMENT	(1ype or print)		MICHAEL		TONE / PCO		MAIL: michael.black	stone@darp:	a.mil
19B. NAME OF CONTRACTOR BY	19C. DAT	E SIGNED	 	UTED ST	ATES OF A		22	20C. DA	ATE SIGNED
(Signature of person authorized to sign)					(Signature	of Contracting Offic			
NO. 2546 OL 152 0060		200	107				91	AND A DIN FOIL	RM 26 (REV 12/2002

Section B - Supplies or Services and Prices

ITEM NO	SUPPLIES/SERVICES	ESTIMATED COST	FIXED FEE	TOTAL EST. COST PLUS FIXED FEE
0001	RIFL Phase I (Base) AO No. X670/04 & X670/08	(b)(4)	(b)(4)	\$3,530,165.00
	The contractor shall conduct the Phase 1 research entitled "Multi-kW Fiber MOPA for Coherent Applications," in accordance with the Attachment 1 Statement of Work, dated 15 September 2008 and in Section C herein. Data deliverables/reports shall be provided in accordance with Sections C and F herein.			\$3,530,165.00

ITEM NO 000101

Funding for CLIN 0001 only

AMOUNT \$0.00

AO No. X670/04 & X670/08

ACRN AA

\$553,000.00

Page 3 of 34

TOTAL EST. COST PLUS **ESTIMATED FIXED** FEE FIXED FEE COST ITEM NO SUPPLIES/SERVICES (b)(4)(b)(4) \$2,431,306.00 RIFL Phase II (Option) 0002 AO No. X670/04 & X670/08 \$2,431,306.00 The contractor shall conduct the Phase 1 research entitled "Multi-kW Fiber MOPA for Coherent Applications," in accordance with the Attachment 1 Statement of Work, dated 15 September 2008 and in Section C herein. Data deliverables/reports shall be provided in accordance with Sections C and

F herein.

Section C - Descriptions and Specifications

CLAUSES INCORPORATED BY FULL TEXT

C-1 Scope of Work

(a) The Contractor shall furnish the necessary personnel, materials, facilities and other services as may be required to perform Contract Line Item Number (CLIN) 0001, and to the extent the Option is exercised, CLIN 0002, in accordance with the Statement of Work, Attachment 1 hereto.

C-2 Reports and Other Deliverables

(a) The Contractor shall submit the following reports and other deliverables in accordance with the delivery schedule set forth in Section F. Reports and other deliverables shall be submitted in writing, as defined in FAR 2.101, or as specified below:

(1) R&D STATUS REPORT (MONTHLY)

This brief narrative, not to exceed five pages in length, shall contain the following:

- (i) Description of progress during the reporting period, supported by reasons for any change in approach reported previously.
- (ii) The contractor shall also discuss any technical and/or financial problems discovered during the reporting period in this narrative.

(2) DETAILED TECHNICAL/FINANCIAL REPORT (QUARTERLY)

This detailed narrative does not have page restrictions and shall contain the following:

- (i) For first report only; the date work actually started.
- (ii) Description of progress during the reporting period, supported by reasons for any change in approach reported previously
- (iii) Planned activities and milestones for the next reporting period.
- (iv) Description of any major items of experimental or special equipment purchased or constructed during the reporting period.
- (v) Notification of any changes in key personnel associated with the contract during the reporting period.
- (vi) Summary of substantive information derived from noteworthy trips, meetings, and special conferences held in connection with the contract during the reporting period.
- (vii) Summary of all problems or areas of concern.
- (viii) Related accomplishments since last report.
- (ix) Fiscal status, to include reporting of summary level financial data in the following format: (next page)

R&D STATUS REPORT PROGRAM FINANCIAL STATUS

Work Breakdown		Cur	nulative to Date		At (Completion
Structure or Task Element	Planned Expend	Actual Expend	% Budget Compl	At Compl	Latest Revised Estimate	Remarks
Subtotal:						· · · · · · · · · · · · · · · · · · ·
Management Reserve:		· · · · · · · · · · · · · · · · · · ·				
Or Unallocated Resources:						
TOTAL:						
Note: Budget a overrun)	t completion of	changes only with	the amount of any	scope chang	es. (Not affec	ted by underrun or
Based on curren	ntly authorized	d work:				
Is curre	ent funding st	afficient for the cur	rrent fiscal year (F)	Y)? (Explair	in narrative i	f"NO")
	YES NO)				
What i	s the next FY	funding requirem	ent at current antic	ipated level	s?	
	\$					
Have y	ou included is	n the report narrat	ive any explanatior	of the abov	e data and are	they cross-referenced?
	YES 'NO)				

(2) FINAL REPORT

This report shall document the results of the complete effort and should be delivered at the completion of the contract. If the Government chooses to exercise the options under this contract, the due date for the final report is extended accordingly. Title pages shall include a disclaimer worded substantially as follows:

"The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the official policies, either expressly or implied, of the Defense Advanced Research Projects Agency or the U.S. Government."

The Final Technical Report summary shall include:

Task Objectives
Technical Problems
General Methodology (i.e., literature review, laboratory experiments, surveys, etc.)
Technical Results
Important Findings and Conclusions
Significant Hardware Development
Special Comments
Implications for Further Research
Standard Form 298, September 1988

(3) ALL REPORTS

- (a) Reports delivered by the Contractor in the performance of the contract shall be considered "Technical Data" as defined in Section I contract clauses entitled "Rights in Technical Data Noncommercial Items" and "Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation."
- (b) Bulky Reports shall be mailed by other than first-class mail unless the urgency of submission requires use of first-class mail. In this situation, one copy shall be mailed first-class and the remaining copies forwarded by less than first-class.
- (c) All papers and articles published as a result of DARPA sponsored research shall include a statement reflecting the sponsorship. In addition, a bibliography of the titles and authors of all such papers are to be included in the Final Technical Report
 - (i) The cover or title page of each of the above reports or publications prepared, will have the following citation:

Sponsored by
Defense Advanced Research Projects Agency
Microsystems Technology Office (MTO)
Program: Revolution in Fiber Lasers (RIFL)
Issued by DARPA/CMO under Contract No: HR0011-09-C-0028

(ii) The title page shall include a disclaimer worded substantially as follows:

"The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the official policies, either expressly or implied, of the Defense Advanced Research Projects Agency or the U.S. Government."

- (d) All technical reports must (i) be prepared in accordance with American National Standards Institute (ANSI) Standard Z39.18; (ii) include a Standard Form 298, August 1998; and (iii) be marked with an appropriate Distribution Statement.
- (e) Distribution Statement B applies.

"Distribution authorized to U.S. Government agencies only due to the inclusion of proprietary information and to prevent Premature Dissemination of potentially critical technological Information. Other requests for this document shall be referred to DARPA Technical Information Office via email at tio@darpa.mil."

Note to contractor: In accordance with the applicable Data Rights clauses(s), all proprietary information within the data deliverables shall be clearly identified/marked as such for each such occurrence (use of footnotes, or similar forms of reference, for purposes of such identification is encouraged).

(4) ADDITIONAL MISCELLANEOUS DATA DELIVERABLES

The Contractor shall also deliver those items listed in the Contract Attachment (1) - Statement of Work under the paragraph entitled "Deliverables", as applicable. The Contractor shall adhere to the schedule, as applicable, in the Statement of Work. Briefing materials (hard and softcopy) for all briefings given to the Government shall be provided in the Contractor's format.

(end of clause)

Section D - Packaging and Marking

CLAUSES INCORPORATED BY FULL TEXT

D-1 Packaging and Marking

(a) All items shall be preserved, packaged, packed and marked in accordance with best commercial practices to meet the packing requirements of the carrier, and to ensure safe delivery at destination.(end of clause) Section E - Inspection and Acceptance

INSPECTION AND ACCEPTANCE TERMS

Supplies/services will be inspected/accepted at destination by Contracting Officer's Representative identified in Section G herein.

Use of the DD 250 is required only for submission of the Program Final Report. (end of clause).

CLAUSES INCORPORATED BY REFERENCE

52.246-8	Inspection Of Research And Development Cost	MAY 2001
	Reimbursement	
252.246-7000	Material Inspection And Receiving Report	MAR 2008

Section F - Deliveries or Performance

DELIVERY INFORMATION

CLIN	DELIVERY DATE	QUANTITY	SHIP TO ADDRESS	UIC
0001	18 mths. ADC		SPAWAR SYSTEMS CENTER SAN DIEGO DR. FRANK HANSON SPAWARSYSCEN 55430 53490 DOW STREET SAN DIEGO CA 92152-5743 (619) 553-2094 FOB: Destination	N00039
000101	18 mths. ADC		(SAME AS PREVIOUS LOCATION) FOB: Destination	N00039
0002	15 mths. ADC		(SAME AS PREVIOUS LOCATION) FOB: Destination	N00039

CLAUSES INCORPORATED BY REFERENCE

52.242-15 Alt I	Stop-Work Order (Aug 1989) - Alternate I	APR 1984
52.247-34	F.O.B. Destination	NOV 1991

CLAUSES INCORPORATED BY FULL TEXT

F-1 Term of Contract

- (a) The term of the contract commences 03 October 2008 and continues through 03 April 2009.
- (b) The period of performance for Option 1, as set forth in CLIN 0002, shall be from the effective date of the option exercise to and including 15 months thereafter.
 (end of clause)

F-2 Reports and Other Deliverables

(a) Delivery of all reports and other deliverables shall be made to the addressee specified in F-3 entitled "Report Distribution" in accordance with the following:

Item No.	Description	Due Date (on or before)
0001,0002 0001,0002	R&D Status Reports Interim R&D Technical Reports	Monthly IAW Section C-2 Quarterly IAW Section C-2

0001,0002

RIFL Final Report

18 months after date of contract award (03

April 2009)

If option is exercised, 33 months after date of contract award (03 July 2011)

0001,0002

Additional Misc. Deliverables

As required IAW Section C-2

(end of clause)

F-3 Report Distribution

(a) DARPA/MTO (RIFL Program Manager)

Attn: Joseph Mangano 3701 North Fairfax Drive Arlington, VA 22203-1714

Email: (Joseph.Mangano@darpa.mil) (one copy each report/data deliverable)

(b) DARPA

Attn: ADPM (R. Glaze)
3701 North Fairfax Drive
Arlington, VA 22203-1714
(one copy each monthly status report and final report)

(c) DARPA/Library 3701 North Fairfax Drive Arlington, VA 22203-1714 Email: <u>library@darpa.mil</u>

(one copy of the Final Technical Report)

- (d) Defense Technical Information Center
 - Email: TR@dtic.mil (one electronic copy of the Final Technical Report, if unclassified)

OR

(2) Attn: DTIC-BCS
 8725 John J. Kingman Road, Suite 0944
 Fort Belvoir, VA 22060-0944
 (two hard copies of the Final Technical Report if unclassified)

(e) DARPA/CMO

Attn: Michael Blackstone
3701 North Fairfax Drive
Email: Michael.Blackstone@darpa.mil
Arlington, VA 22203-1714
(one copy each monthly status report and final report)

(f) COR Attn: Dr. Frank Hanson SPAWARSYSCEN 55430 53490 Dow Street San Diego, CA 92152-5743 Email: <u>hansonfe@spawar.navy.mil</u> (one copy each report/data deliverable)

(end of clause)

Note 1: (a) through (f) – submission of unclassified materials only. Submission of classified material shall be coordinated through DARPA SID and/or the DARPA Program Manager in accordance with the attached DD 254, as applicable.

Note 2: (a) through (f) – Interim Report submissions may be made electronically via e-mail. Final Report submissions shall be made in hardcopy and CD soft copy.

Note 3: For the Final Technical Report (s), the Contractor must also comply with the distribution requirements of DFARS 252.235-7011, as applicable.

F-4 Notice Regarding Late Delivery

(a) In the event the Contractor anticipates difficulty in complying with the contract delivery schedule, the Contractor shall immediately notify the Contracting Officer in writing, giving pertinent details, including the date by which it expects to make delivery; PROVIDED, however, that this date shall be informational only in character and the receipt thereof shall not be construed as a waiver by the Government of any contract delivery schedule, or any rights or remedies provided by law or under this contract.

(end of clause)

Section G - Contract Administration Data

ACCOUNTING AND APPROPRIATION DATA

CLAUSES INCORPORATED BY FULL TEXT

252.204-7006 BILLING INSTRUCTIONS (OCT 2005)

When submitting a request for payment, the Contractor shall--

- (a) Identify the contract line item(s) on the payment request that reasonably reflect contract work performance; and
- (b) Separately identify a payment amount for each contract line item included in the payment request.

(End of clause)

G-1 Procuring Office Representative

- (a) The Procuring Office Representative is Michael Blackstone, DARPA/CMO, 3701 North Fairfax Drive, Arlington, VA 22203-1714, telephone: 571-218-4804, e-mail: Michael.Blackstone@darpa.mil
- (b) Notwithstanding any other provision of this contract, the Contracting Officer is the only individual authorized to redirect the effort or in any way amend or modify any of the terms of this contract. If, as a result of technical discussions, it is desirable to alter contract obligations or the statement of work, a modification must be issued in writing and signed by the Contracting Officer.
 (end of clause)

G-2 Electronic Submission of Payment Requests

Customer Service at 866-618-5988.

- (a) Invoices for goods received or services rendered under this contract shall be submitted electronically through Wide Area Work Flow Receipt and Acceptance (WAWF):
 - (1) Vendors that have never used WAWF shall follow the directions in the <u>WAWF Vendor Getting</u>

 <u>Started Guide</u> available at the following website:

 http://www.dfas.mil/contractorpay/electroniccommerce/wideareaworkflow.html. This website also contains links for Vendor training and practice. Additional support can be obtained by calling WAWF

- (2) Back up documentation (such as timesheets, monthly status reports, etc.) can be included and attached to the invoice in WAWF. Attachments should be in PDF format, but Attachments created in any Microsoft Office product may be attached. Total limit for the size of files per invoice is 5 megabytes.
- (b) The following information, regarding invoice routing DoDAAC's, must be entered for completion of the invoice in WAWF:

WAWF Invoice Type:	Cost Voucher	
Issuing Office DoDAAC	HR0011.	
Admin Offfice DoDAAC	S2404A	
Service Approver DoDAAC	S2404A	
DCAA Office DoDAAC	HAA210	
Paying Office DoDAAC	HQ0338	

(c) Cost Vouchers from Contractors approved by DCAA for direct billing will be directly routed to DFAS. Cost Vouchers from Contractors not approved for direct billing will be routed to DCAA for approval before the Cost Voucher is routed to DFAS. All Final Cost Voucher submissions will be routed to the Service Approver for approval. The DCAA office for this award is:

	AND STATE			
8441 Belair Road		DeDAA	C: HAA210	
Suite 102		COMPANY AND SECURITY OF SECURITY SECURI	o: (410) 962-3857	1
Baltimore, MD 21	236-3024	7 5 9 5 L S. C. C. S. S. C. S.	(410) 962-9976 Icaa-fao6141@de	enamil

(d) For each invoice/cost voucher submitted for payment, the contractor shall also e-mail the WAWF automated invoice notice directly to the following points of contact:

E-mail	Phone	Role	
hansonfe@spawar.navy.mil	619-553-2094	COR	
1		hansonfe@spawar.navy.mil 619-553-2094	

G-3 Delegation of Authority for Contract Administration

 (a) DCMA Virginia (S2404A), is hereby designated as the Contracting Officer's authorized representative for administering this contract in accordance with current directives.
 (end of clause)

G-4 Contracting Officer's Representative (COR)

(a) Performance of work under this contract shall be subject to the technical direction of Frank Hanson, SPAWARSYSCEN 55430, 53490 Dow Street San Diego, CA 92152-5743, telephone (619)553-2094, e-mail: hansonfe@spawar.navy.mil. Such technical direction includes those instructions to the Contractor necessary to accomplish the Statement of Work. The COR is not otherwise authorized to make any representations or commitments of any kind on behalf of the Contracting Officer or the Government. The COR does not have the authority to alter the Contractor's obligations or to change the specifications of the contract.

- (b) Technical direction shall not include any direction which:
 - (1) Constitutes additional work outside the scope of work;
 - (2) Constitutes a change as defined in Section I contract clause entitled "Changes";
 - (3) In any manner causes an increase or decrease in the total estimated cost or the time required for contract performance; or
 - (4) Changes any of the stated terms, conditions, or specifications of the contract.
- (5) See Attachment (2) (end of clause)
- G-5 Payment Instructions for Multiple Accounting Classification Citations
- (a) Payments under contract line items funded by multiple accounting classification citations shall be made from the earliest available fiscal year funding sources. The earliest assigned ACRN must be fully disbursed before making disbursements from a succeeding ACRN.
 (end of clause)

G-6 Incremental Funding

(a) This contract shall be subject to incremental funding, as indicated in the table below, which is presently made available for performance under this contract. It is estimated that the funds presently available are sufficient to permit the Contractor's performance through the performance end dates indicated in the table below. Except in accordance with the Section I clause FAR 52.232-22, "Limitation of Funds," no legal liability of the part of the Government for payment of any money in excess of the funds listed in the table below shall arise unless and until additional funds are made available by the Contracting Officer through a modification to this contract.

		Funding Provided to	Funding Period of Performance End
Phase	CLIN	Date	Date
1	0001	\$553,000	30 November 2008
2	0002	TBD	TBD

(end of clause)

G-7 Payment of Cost and Fee

- (a) As consideration for the proper performance of work required under this contract, the Contractor shall be paid as follows:
 - (1) Costs, as provided for under Section I contract clause titled "Allowable Cost and Payment" not to exceed the amount set forth as "Total Estimated Cost" in Section B, and subject further to those Section I clauses entitled "Limitation of Cost" or "Limitation of Funds".

(2) A fixed fee in the amount set forth as "Fixed Fee" in Section B, in accordance with the Section I contract clause entitled "Fixed Fee". The Contractor may bill on each invoice the amount of the fixed fee bearing the same percentage to the total fixed fee as the amount of cost billed bears to the total estimated cost.

(end of clause)

Section H - Special Contract Requirements

CLAUSES INCORPORATED BY FULL TEXT

H-1 Type of Contract

(a) This is a Cost-Plus-Fixed-Fee completion contract. (end of clause)

H-2 Public Release or Dissemination of Information

- (a) There shall be no dissemination or publication, except within and between the Contractor and any subcontractors, of information developed under this contract or contained in the reports to be furnished pursuant to this contract without prior written approval of the DARPA Technical Information Officer (DARPA/TIO). All technical reports will be given proper review by appropriate authority to determine which Distribution Statement is to be applied prior to the initial distribution of these reports by the Contractor. Papers resulting from unclassified contracted fundamental research are exempt from prepublication controls and this review requirement, pursuant to DoD Instruction 5230.27 dated October 6, 1987.
- (b) When submitting material for written approval for open publication as described in subparagraph (a) above, the Contractor must submit a request for public release request to the DARPA TIO and include the following information: 1) Document Information: document title, document author, short plain-language description of technology discussed in the material (approx 30 words), number of pages (or minutes of video) and document type (briefing, report, abstract, article, or paper); 2) Event Information: event type (conference, principle investigator meeting, article or paper), event date, desired date for DARPA's approval; 3) DARPA Sponsor: DARPA Program Manager, DARPA office, and contract number; and 4) Contractor's Information: POC name, e-mail and phone. Allow four weeks for processing; due dates under four weeks require a justification. Unusual electronic file formats may require additional processing time. Requests can be sent either via e-mail to tio@darpa.mil or via 3701 North Fairfax Drive, Arlington VA 22203-1714, telephone (571) 218-4235. Refer to www.darpa.mil/tio for information about DARPA's public release process.
- (c) See also Section I, Clause 252.235-7010, "Acknowledgement of Support and Disclaimer." (end of clause)

H-3 Key Personnel

(a) The Contractor shall notify the Contracting Officer prior to making any change in key personnel. Key personnel are defined as follows:

(b)(4)		

(b) The Contractor must demonstrate that the qualifications of the prospective personnel are equal to or better than the qualifications of the personnel being replaced. Notwithstanding any of the foregoing provisions, key personnel shall be furnished unless the Contractor has demonstrated to the satisfaction of the COR that the qualifications of the proposed substitute personnel are equal to or better than the qualifications of the personnel being replaced.

(end of clause)

H-4 Restrictions on Printing

(a) Unless otherwise authorized in writing by the Contracting Officer, reports, data, or other written material produced using funds provided by this contract and submitted hereunder shall be reproduced only by duplicating processes and shall not exceed 5,000 single page reports or a total of 25,000 pages of a multiple-page report. These restrictions do not preclude the writing, editing, preparation of manuscript or reproducible copy of related illustrative materials if required as part of this contract, or incidental printing such as forms or materials necessary to be used by the Contractor to respond to the terms of the contract. (end of clause)

H-5 Contractor Representations and Certifications

 (a) The Contractor's Representations and Certifications dated 3 July 2008 (ORCA) and 11 July 2008 are incorporated herein by reference.
 (end of clause)

H-6 Insurance Schedule

(a) The Contractor shall maintain the types of insurance listed in FAR 28.307-2 (a), (b) and (c), with the minimum amounts of liability indicated therein. The types of insurance coverage listed in paragraphs (d) and (e) shall also be maintained when applicable.(end of clause)

H-7 Travel

- (a) Reimbursement for travel-related expenses shall be in accordance with the Contractor's approved travel policy. The Federal Travel Regulations, Joint Travel Regulations (JTR), and Standardized Regulations as stated in FAR 31.205-46 will be used as a guide in determining reasonableness of per diem costs. Costs for travel shall be allowable subject to the provisions of FAR 31.205-46.
- (b) In connection with direct charge to the contract of travel-related expenses, the Contractor shall hold travel to the minimum required to meet the objectives of the contract, and substantial deviations from the amount of travel agreed to during contract negotiation shall not be made without the authorization of the Contracting Officer.

When applicable, the Contractor shall notify the COR of proposed travel of an employee beyond that agreed to during negotiations.

(c) Approval of the Contracting Officer shall be obtained in advance for attendance by personnel at training courses, seminars, and other meetings not directly related to contract performance if the costs for the courses, seminars, and other meetings are charged to the contract.

(d) All foreign travel shall be authorized and approved in advance, in writing, by the Contracting Officer. Request for such travel must be submitted to the Contracting Officer at least 45 days in advance of traveler's anticipated departure date, and shall include traveler's itinerary of United States Flag Air Carriers. (end of clause)

H-8 Metric System

- (a) The Defense Advanced Research Projects Agency (DARPA) will consider the use of the metric system in all of its activities consistent with operational, economical, technical and safety requirements.
- (b) The metric system will be considered for use in all new designs. When it is deemed not to be in the best interest of the DoD to provide metric design, justification shall be provided.
- (c) Physical and operational interfaces between metric items and U.S. customary items will be designed to assure that interchangeability and interoperability will not be affected.
- (d) Existing designs dimensioned in U.S. customary units will be converted to metric units only if determined to be necessary or advantageous. Unnecessary retrofit of existing systems with new metric components will be avoided where both the new metric and existing units are interchangeable and interoperable. Normally, the system of measurement in which an item is originally designed will be retained for the life of the item.
- (e) During the metric transition phase hybrid metric and U.S. customary designs will be necessary and acceptable. Material components, parts, subassemblies, and semi-fabricated material, which are of adequate or when it is otherwise specifically determined to be in the best interest of the Department of Defense. Bulk materials will be specified and accepted in metric units when it is expedient or economical to do so.
- (f) Technical reports, studies, and position papers, (except those pertaining to items dimensioned in U.S. customary units) will include metric units of measurement in addition to or in lieu of U.S. customary units. With respect to existing contracts, this requirement applies only if such documentation can be obtained without an increase in contract costs.
- (g) Use of the dual dimensions (i.e., both metric and U.S. customary dimensions) on drawings will be avoided unless it is determined in specific instances that such usage will be beneficial. However, the use of tables on the document to translate dimensions from one system of measurement to the other is acceptable. (end of clause)

H-9 Consent to Subcontract

(a) Pursuant to the clause of the General Provisions entitled "Subcontracts (JUN 2007)," FAR 52.244-2(j), the Contracting Officer hereby consents to the placement of subcontract(s) with the following firm(s)/consultant(s) at the ceiling amounts specified:



	(b) Approval must be obtained from the Administrative Contracting Officer (ACO) to increase/decrease the
	use of the above listed subcontractors by greater than 5% from the level established in subparagraph (a).
(eı	nd of clause)

H-10 Government Furnished Property/Facilities and Services

(a) In accordance with the Section I contract clause entitled "Government Property", the following property, facilities and/or services shall be provided for use in the performance of this contract. OTY PROPERTY NOMENCLATURE **DELIVERY TO**

NONE IDENTIFIED AT TIME OF AWARD

(end of clause)

Invention Disclosure Reports (DFARS 252.227-7038) H-11

All written communications required by this clause shall be submitted to the Administrative Contracting Officer (ACO). All required reporting (invention disclosures, patent disclosures, etc.) shall be accomplished using the i-Edison.gov reporting website (http://s-edison.info.nih.gov/iEdison/).

- H-12 Contractor Acquired Property (IT)
 - (a) Performance of this contract will require use of the information technology (IT) resources listed below, acquisition of which (or equivalent) is hereby authorized:

TOTAL AMOUNT ITEM NONE IDENTIFIED AT TIME OF AWARD

- (b) The costs incurred by the Contractor in acquiring the IT listed in paragraph (1.) above shall be considered allowable costs under the contract provided that the total net amount of the IT does not exceed . The Contractor shall have no obligation to acquire IT and the Government shall have no obligation to reimburse any amount for IT in excess of the amount set forth above unless the contract is modified to increase this amount.
- (c) The IT resources listed above shall be considered Government Property and shall be subject to the provisions of FAR 52.245-1, incorporated in Section I.
- (d) The Contractor shall not use Contractor acquired property listed above for work other than that performed pursuant to this contract unless so authorized in writing by the Contracting Officer.
- (e) This authorization is subject to the Contractor's compliance with the approvals and screening requirements set forth in DFARS Subpart 239.73 and DoD 7950.1-M, "Defense Automation Resources Management Manual."
 - (1) Use of the DD Form 1851 for determining availability of excess information technology (IT) is only required for IT with a unit acquisition cost of \$ _ and above.
- (2) On-line screening for excess IT, regardless of cost, via remote terminal dial-up, is available to contractors through their Administrative Contracting Officers. (end of clause)
- H-13 Proprietary Technical Data and Computer Software

(a) Any deliverable technical data or computer software developed or generated at private expense and considered to be proprietary by the Contractor or subcontractors shall be delivered in accordance with DFARS 252.227-7013 and 252.227-7014. No items have been identified at time of award. (end of clause)

H-14 Consultants

(a) The contractor is authorized to use the following consultants to the extent indicated:

Name

No. of Hours

Rate

Total Amount

NO CONSULTANTS AUTHORIZED AS OF THE EFFECTIVE DATE OF THIS CONTRACT.

(b) Approval must be obtained from the Administrative Contracting Officer to increase the use of consultants from the level estimated in subparagraph (1.).(end of clause)

H-15 Export Control Clause

Should this project develop beyond fundamental research (basic and applied research ordinarily published and shared broadly within the scientific community) with military or dual-use applications the following apply:

- (a) The contractor shall comply with all U. S. export control laws and regulations, including the International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120 through 130, and the Export Administration Regulations (EAR), 15 CFR Parts 730 through 799, in the performance of this contract. In the absence of available license exemptions/exceptions, the Contractor shall be responsible for obtaining the appropriate licenses or other approvals, if required, for exports of (including deemed exports) hardware, technical data, and software, or for the provision of technical assistance.
- (b) The Contractor shall be responsible for obtaining export licenses, if required, before utilizing foreign persons in the performance of this contract, including instances where the work is to be performed on-site at any Government installation (whether in or outside the United States), where the foreign person will have access to export-controlled technical data or software.
- (c) The Contractor shall be responsible for all regulatory record keeping requirements associated with the use of licenses and license exemptions/exceptions.
- (d) The Contractor shall be responsible for ensuring that the provisions of this clause apply to its subcontractors.

(end of clause)

Section I - Contract Clauses

CLAUSES INCORPORATED BY REFERENCE

	•	
52.202-1	Definitions	JUL 2004
52.203-3	Gratuities	APR 1984
52.203-5	Covenant Against Contingent Fees	APR 1984
52.203-6	Restrictions On Subcontractor Sales To The Government	SEP 2006
52.203-7	Anti-Kickback Procedures	JUL 1995
52.203-8	Cancellation, Rescission, and Recovery of Funds for Illegal or Improper Activity	JAN 1997
52.203-10	Price Or Fee Adjustment For Illegal Or Improper Activity	JAN 1997
52.203-12	Limitation On Payments To Influence Certain Federal Transactions	SEP 2007
52.204-4	Printed or Copied Double-Sided on Recycled Paper	AUG 2000
52.204-7	Central Contractor Registration	APR 2008
52.209-6	Protecting the Government's Interest When Subcontracting With Contractors Debarred, Suspended, or Proposed for Debarment	SEP 2006
52.215-2	Audit and RecordsNegotiation	JUN 1999
52.215-8	Order of PrecedenceUniform Contract Format	OCT 1997
52.215-10	Price Reduction for Defective Cost or Pricing Data	OCT 1997
52.215-12	Subcontractor Cost or Pricing Data	OCT 1997
52.215-14 Alt I	Integrity of Unit Prices (Oct 1997) - Alternate I	OCT 1997
52.215-15	Pension Adjustments and Asset Reversions	OCT 2004
52.215-17	Waiver of Facilities Capital Cost of Money	OCT 1997
52.215-18	Reversion or Adjustment of Plans for Postretirement Benefits	JUL 2005
	(PRB) Other than Pensions	
52.215-21	Requirements for Cost or Pricing Data or Information Other	OCT 1997
	Than Cost or Pricing DataModifications	
52.216-7	Allowable Cost And Payment	DEC 2002
52.216-8	Fixed Fee	MAR 1997
52.219-8	Utilization of Small Business Concerns	MAY 2004
52.222-3	Convict Labor	JUN 2003
52.222-21	Prohibition Of Segregated Facilities	FEB 1999
52.222-26	Equal Opportunity	MAR 2007
52.222-35	Equal Opportunity For Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans	SEP 2006
52.222-36	Affirmative Action For Workers With Disabilities	JUN 1998
52.222-37	Employment Reports On Special Disabled Veterans,	SEP 2006
	Veterans Of The Vietnam Era, and Other Eligible Veterans	
52.222-39	Notification of Employee Rights Concerning Payment of	DEC 2004
	Union Dues or Fees	
52.222-50	Combating Trafficking in Persons	AUG 2007
52.223-14	Toxic Chemical Release Reporting	AUG 2003
52.225-13	Restrictions on Certain Foreign Purchases	JUN 2008
52.226-1	Utilization Of Indian Organizations And Indian-Owned Economic Enterprises	JUN 2000
52.227-1 Alt I	Authorization And Consent (Dec 2007) - Alternate I	APR 1984
52.227-2	Notice And Assistance Regarding Patent And Copyright Infringement	DEC 2007
52.228-7	InsuranceLiability To Third Persons	MAR 1996

52.230-2		APR 1998
52.230-6		MAR 2008
52.232-9	Limitation On Withholding Of Payments	APR 1984
52.232-20	Limitation Of Cost	APR 1984
52.232-22	Limitation Of Funds	APR 1984
52.232-23 Alt I	Assignment of Claims (Jan 1986) - Alternate I	APR 1984
52.232-25	1	OCT 2003
52.232-33		OCT 2003
***	Registration	TI II 0000
52.233-1	Disputes	JUL 2002
52.233-3 Alt I	Protest After Award (Aug 1996) - Alternate I	JUN 1985
52.242-1	Notice of Intent to Disallow Costs	APR 1984
52.242-3	Penalties for Unallowable Costs	MAY 2001
52.242-4	Certification of Final Indirect Costs	JAN 1997
52.242-13	Bankruptcy	JUL 1995
52.243-2 Alt V	ChangesCost-Reimbursement (Aug 1987) - Alternate V	APR 1984
52.244-2	Subcontracts	JUN 2007
52.244-5	Competition In Subcontracting	DEC 1996
52.244-6	Subcontracts for Commercial Items	MAR 2007
52.245-1 (Dev)	Government Property (June 2007) Use And Charges	JUN 2007 JUN 2007
52.245-9 52.249-6	•	MAY 2004
52.249-14	Termination (Cost Reimbursement) Excusable Delays	APR 1984
52.253-1	Computer Generated Forms	JAN 1991
252.201-7000	Contracting Officer's Representative	DEC 1991
252.201-7000	Prohibition On Persons Convicted of Fraud or Other	DEC 2004
232.203-7001	Defense-Contract-Related Felonies	DEC 2004
252.204-7003	Control Of Government Personnel Work Product	APR 1992
	Central Contractor Registration (52.204-7) Alternate A	SEP 2007
252.204-7004 7110 71	Requirements for Contracts Involving Export-Controlled	JUL 2008
232.204-7000	Items	JOD 2000
252.205-7000	Provision Of Information To Cooperative Agreement Holders	DEC 1991
252,209-7004	Subcontracting With Firms That Are Owned or Controlled	DEC 2006
	By The Government of a Terrorist Country	
252.211-7007	Item Unique Identification of Government Property	SEP 2007
252.215-7000	Pricing Adjustments	DEC 1991
252.215-7002	Cost Estimating System Requirements	DEC 2006
252.215-7004	Excessive Pass-Through Charges	MAY 2008
252.225-7006	Quarterly Reporting of Actual Contract Performance Outside	MAY 2007
	the United States	
252.225-7012	Preference For Certain Domestic Commodities	MAR 2008
252.226-7001	Utilization of Indian Organizations and Indian-Owned	SEP 2004
	Economic Enterprises, and Native Hawaiian Small Business	
	Concerns	
252.227-7013	Rights in Technical DataNoncommercial Items	NOV 1995
252.227-7014	Rights in Noncommercial Computer Software and	JUN 1995
	Noncommercial Computer Software Documentation	
252.227-7015	Technical DataCommercial Items	NOV 1995
252.227-7016	Rights in Bid or Proposal Information	JUN 1995
252.227-7019	Validation of Asserted RestrictionsComputer Software	JUN 1995
252.227-7027	Deferred Ordering Of Technical Data Or Computer Software	
252.227-7037	Validation of Restrictive Markings on Technical Data	SEP 1999
252.231-7000	Supplemental Cost Principles	DEC 1991

252.232-7003	Electronic Submission of Payment Requests and Receiving	MAR 2008
	Reports	
252.232-7010	Levies on Contract Payments	DEC 2006
252.235-7011	Final Scientific or Technical Report	NOV 2004
252.242-7004	Material Management And Accounting System	NOV 2005
252.243-7002	Requests for Equitable Adjustment	MAR 1998
252.244-7000	Subcontracts for Commercial Items and Commercial	JAN 2007
	Components (DoD Contracts)	
252.247-7023	Transportation of Supplies by Sea	MAY 2002
252.247-7024	Notification Of Transportation Of Supplies By Sea	MAR 2000

CLAUSES INCORPORATED BY FULL TEXT

52.203-14 DISPLAY OF HOTLINE POSTER(S) (DEC 2007)

(a) Definition.

United States, as used in this clause, means the 50 States, the District of Columbia, and outlying areas.

- (b) Display of fraud hotline poster(s). Except as provided in paragraph (c)-
- (1) During contract performance in the United States, the Contractor shall prominently display in common work areas within business segments performing work under this contract and at contract work sites--
- (i) Any agency fraud hotline poster or Department of Homeland Security (DHS) fraud hotline poster identified in paragraph (b)(3) of this clause; and
- (ii) Any DHS fraud hotline poster subsequently identified by the Contracting Officer.
- (2) Additionally, if the Contractor maintains a company website as a method of providing information to employees, the Contractor shall display an electronic version of the poster(s) at the website.
- (3) Any required posters may be obtained as follows:

Poster(s) Obtain from

(3) Any required posters may be obtained as follows:

Poster(s) Obtain from

DoD Inspector General, ATTN: Defense Hotline, 400 Army Navy Drive, Washington, DC 22202-2884

- (c) If the Contractor has implemented a business ethics and conduct awareness program, including a reporting mechanism, such as a
- hotline poster
- http://farsite.hill.af.mil/otcgi/llscgi60.exe?ACTION=Highlight&QUERY=%68%6F%74%6C%69%6E%65%20%70%6F%73%74%65%72&OP=and&DB=2&SORTBY=%54%49%54%4C%45&SUBSET=SUBSET&FROM=1&SIZE=50&ITEM=3#test9#test9>, then the Contractor need not display any agency fraud hotline posters as required in paragraph (b) of this clause, other than any required DHS posters.

- (d) Subcontracts. The Contractor shall include the substance of this clause, including this paragraph (d), in all subcontracts that exceed \$5,000,000, except when the subcontract—
- (1) Is for the acquisition of a commercial item; or
- (2) Is performed entirely outside the United States.

(End of clause)

52.215-19 NOTIFICATION OF OWNERSHIP CHANGES (OCT 1997)

- (a) The Contractor shall make the following notifications in writing:
- (1) When the Contractor becomes aware that a change in its ownership has occurred, or is certain to occur, that could result in changes in the valuation of its capitalized assets in the accounting records, the Contractor shall notify the Administrative Contracting Officer (ACO) within 30 days.
- (2) The Contractor shall also notify the ACO within 30 days whenever changes to asset valuations or any other cost changes have occurred or are certain to occur as a result of a change in ownership.
- (b) The Contractor shall--
- (1) Maintain current, accurate, and complete inventory records of assets and their costs;
- (2) Provide the ACO or designated representative ready access to the records upon request;
- (3) Ensure that all individual and grouped assets, their capitalized values, accumulated depreciation or amortization, and remaining useful lives are identified accurately before and after each of the Contractor's ownership changes; and
- (4) Retain and continue to maintain depreciation and amortization schedules based on the asset records maintained before each Contractor ownership change.

The Contractor shall include the substance of this clause in all subcontracts under this contract that meet the applicability requirement of FAR 15.408(k).

(End of clause)

52.217-9 OPTION TO EXTEND THE TERM OF THE CONTRACT (MAR 2000)

- (a) The Government may extend the term of this contract by written notice to the Contractor within 18 months from the effective date of CLIN 0001; provided that the Government gives the Contractor a preliminary written notice of its intent to extend at least 14 days (60 days unless a different number of days is inserted) before the contract expires. The preliminary notice does not commit the Government to an extension.
- (b) If the Government exercises this option, the extended contract shall be considered to include this option clause.

(c) The total duration of this contract, including the exercise of any options under this clause, shall not exceed 33 months.

(End of clause)

52.219-28 POST-AWARD SMALL BUSINESS PROGRAM REREPRESENTATION (JUNE 2007)

(a) Definitions. As used in this clause--

Long-term contract means a contract of more than five years in duration, including options. However, the term does not include contracts that exceed five years in duration because the period of performance has been extended for a cumulative period not to exceed six months under the clause at 52.217-8, Option to Extend Services, or other appropriate authority.

Small business concern means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR part 121 and the size standard in paragraph (c) of this clause.

- (b) If the Contractor represented that it was a small business concern prior to award of this contract, the Contractor shall rerepresent its size status according to paragraph (e) of this clause or, if applicable, paragraph (g) of this clause, upon the occurrence of any of the following:
- (1) Within 30 days after execution of a novation agreement or within 30 days after modification of the contract to include this clause, if the novation agreement was executed prior to inclusion of this clause in the contract.
- (2) Within 30 days after a merger or acquisition that does not require a novation or within 30 days after modification of the contract to include this clause, if the merger or acquisition occurred prior to inclusion of this clause in the contract.
- (3) For long-term contracts--
- (i) Within 60 to 120 days prior to the end of the fifth year of the contract; and
- (ii) Within 60 to 120 days prior to the exercise date specified in the contract for any option thereafter.
- (c) The Contractor shall rerepresent its size status in accordance with the size standard in effect at the time of this rerepresentation that corresponds to the North American Industry Classification System (NAICS) code assigned to this contract. The small business size standard corresponding to this NAICS code can be found at http://www.sba.gov/services/contractingopportunities/sizestandardstopics/.
- (d) The small business size standard for a Contractor providing a product which it does not manufacture itself, for a contract other than a construction or service contract, is 500 employees.
- (e) Except as provided in paragraph (g) of this clause, the Contractor shall make the rerepresentation required by paragraph (b) of this clause by validating or updating all its representations in the Online Representations and Certifications Application and its data in the Central Contractor Registration, as necessary, to ensure they reflect current status. The Contractor shall notify the contracting office by e-mail, or otherwise in writing, that the data have been validated or updated, and provide the date of the validation or update.
- (f) If the Contractor represented that it was other than a small business concern prior to award of this contract, the Contractor may, but is not required to, take the actions required by paragraphs (e) or (g) of this clause.

(g) If the Contractor does not have representations and certifications in ORCA, or does not have a representation in ORCA for the NAICS code applicable to this contract, the Contractor is required to complete the following rerepresentation and submit it to the contracting office, along with the contract number and the date on which the rerepresentation was completed:

The Contractor represents that it () is, () is not a small business concern under NAICS Code 541712- assigned to contract number HR0011-09-C-0028.

(Contractor to sign and date and insert authorized signer's name and title).

(End of clause)

52.222-2 PAYMENT FOR OVERTIME PREMIUMS (JUL 1990)

- (a) The use of overtime is authorized under this contract if the overtime premium cost does not exceed \$0.00 or the overtime premium is paid for work --
- (1) Necessary to cope with emergencies such as those resulting from accidents, natural disasters, breakdowns of production equipment, or occasional production bottlenecks of a sporadic nature;
- (2) By indirect-labor employees such as those performing duties in connection with administration, protection, transportation, maintenance, standby plant protection, operation of utilities, or accounting;
- (3) To perform tests, industrial processes, laboratory procedures, loading or unloading of transportation conveyances, and operations in flight or afloat that are continuous in nature and cannot reasonably be interrupted or completed otherwise; or
- (4) That will result in lower overall costs to the Government.
- (b) Any request for estimated overtime premiums that exceeds the amount specified above shall include all estimated overtime for contract completion and shall--
- (1) Identify the work unit; e.g., department or section in which the requested overtime will be used, together with present workload, staffing, and other data of the affected unit sufficient to permit the Contracting Officer to evaluate the necessity for the overtime;
- (2) Demonstrate the effect that denial of the request will have on the contract delivery or performance schedule;
- (3) Identify the extent to which approval of overtime would affect the performance or payments in connection with other Government contracts, together with identification of each affected contract; and
- (4) Provide reasons why the required work cannot be performed by using multishift operations or by employing additional personnel.
- * Insert either "zero" or the dollar amount agreed to during negotiations. The inserted figure does not apply to the exceptions in paragraph (a)(1) through (a)(4) of the clause.

(End of clause)

52.227-11 PATENT RIGHTS--OWNERSHIP BY THE CONTRACTOR (DEC 2007)

(a) As used in this clause--

Invention means any invention or discovery that is or may be patentable or otherwise protectable under title 35 of the U.S. Code, or any variety of plant that is or may be protectable under the Plant Variety Protection Act (7 U.S.C. 2321, et seq.)

Made means--

- (1) When used in relation to any invention other than a plant variety, the conception or first actual reduction to practice of the invention; or
- (2) When used in relation to a plant variety, that the Contractor has at least tentatively determined that the variety has been reproduced with recognized characteristics.

Nonprofit organization means a university or other institution of higher education or an organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954 (26 U.S.C. 501(c)) and exempt from taxation under section 501(a) of the Internal Revenue Code (26 U.S.C. 501(a)), or any nonprofit scientific or educational organization qualified under a State nonprofit organization statute.

Practical application means to manufacture, in the case of a composition of product; to practice, in the case of a process or method; or to operate, in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are, to the extent permitted by law or Government regulations, available to the public on reasonable terms.

Subject invention means any invention of the Contractor made in the performance of work under this contract.

- (b) Contractor's rights. (1) Ownership. The Contractor may retain ownership of each subject invention throughout the world in accordance with the provisions of this clause.
- (2) License. (i) The Contractor shall retain a nonexclusive royalty-free license throughout the world in each subject invention to which the Government obtains title, unless the Contractor fails to disclose the invention within the times specified in paragraph (c) of this clause. The Contractor's license extends to any domestic subsidiaries and affiliates within the corporate structure of which the Contractor is a part, and includes the right to grant sublicenses to the extent the Contractor was legally obligated to do so at contract award. The license is transferable only with the written approval of the agency, except when transferred to the successor of that part of the Contractor's business to which the invention pertains.
- (ii) The Contractor's license may be revoked or modified by the agency to the extent necessary to achieve expeditious practical application of the subject invention in a particular country in accordance with the procedures in FAR 27.302(i)(2) and 27.304-1(f).
- (c) Contractor's obligations. (1) The Contractor shall disclose in writing each subject invention to the Contracting Officer within 2 months after the inventor discloses it in writing to Contractor personnel responsible for patent matters. The disclosure shall identify the inventor(s) and this contract under which the subject invention was made. It shall be sufficiently complete in technical detail to convey a clear understanding of the subject invention. The disclosure shall also identify any publication, on sale (i.e., sale or offer for sale), or public use of the subject invention, or whether a manuscript describing the subject invention has been submitted for publication and, if so, whether it has been accepted for publication. In addition, after disclosure to the agency, the Contractor shall promptly notify the Contracting Officer of the acceptance of any manuscript describing the subject invention for publication and any on sale or public use.

- (2) The Contractor shall elect in writing whether or not to retain ownership of any subject invention by notifying the Contracting Officer within 2 years of disclosure to the agency. However, in any case where publication, on sale, or public use has initiated the 1-year statutory period during which valid patent protection can be obtained in the United States, the period for election of title may be shortened by the agency to a date that is no more than 60 days prior to the end of the statutory period.
- (3) The Contractor shall file either a provisional or a nonprovisional patent application or a Plant Variety Protection Application on an elected subject invention within 1 year after election. However, in any case where a publication, on sale, or public use has initiated the 1-year statutory period during which valid patent protection can be obtained in the United States, the Contractor shall file the application prior to the end of that statutory period. If the Contractor files a provisional application, it shall file a nonprovisional application within 10 months of the filing of the provisional application. The Contractor shall file patent applications in additional countries or international patent offices within either 10 months of the first filed patent application (whether provisional or nonprovisional) or 6 months from the date permission is granted by the Commissioner of Patents to file foreign patent applications where such filing has been prohibited by a Secrecy Order.
- (4) The Contractor may request extensions of time for disclosure, election, or filing under paragraphs (c)(1), (c)(2), and (c)(3) of this clause.
- (d) Government's rights--(1) Ownership. The Contractor shall assign to the agency, on written request, title to any subject invention--
- (i) If the Contractor fails to disclose or elect ownership to the subject invention within the times specified in paragraph (c) of this clause, or elects not to retain ownership; provided, that the agency may request title only within 60 days after learning of the Contractor's failure to disclose or elect within the specified times.
- (ii) In those countries in which the Contractor fails to file patent applications within the times specified in paragraph (c) of this clause; provided, however, that if the Contractor has filed a patent application in a country after the times specified in paragraph (c) of this clause, but prior to its receipt of the written request of the agency, the Contractor shall continue to retain ownership in that country.
- (iii) In any country in which the Contractor decides not to continue the prosecution of any application for, to pay the maintenance fees on, or defend in reexamination or opposition proceeding on, a patent on a subject invention.
- (2) License. If the Contractor retains ownership of any subject invention, the Government shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice, or have practiced for or on its behalf, the subject invention throughout the world.
- (e) Contractor action to protect the Government's interest. (1) The Contractor shall execute or have executed and promptly deliver to the agency all instruments necessary to--
- (i) Establish or confirm the rights the Government has throughout the world in those subject inventions in which the Contractor elects to retain ownership; and
- (ii) Assign title to the agency when requested under paragraph (d) of this clause and to enable the Government to obtain patent protection and plant variety protection for that subject invention in any country.
- (2) The Contractor shall require, by written agreement, its employees, other than clerical and nontechnical employees, to disclose promptly in writing to personnel identified as responsible for the administration of patent matters and in the Contractor's format, each subject invention in order that the Contractor can comply with the disclosure provisions of paragraph (c) of this clause, and to execute all papers necessary to file patent applications on subject inventions and to establish the Government's rights in the subject inventions. The disclosure format

should require, as a minimum, the information required by paragraph (c)(1) of this clause. The Contractor shall instruct such employees, through employee agreements or other suitable educational programs, as to the importance of reporting inventions in sufficient time to permit the filing of patent applications prior to U.S. or foreign statutory bars.

- (3) The Contractor shall notify the Contracting Officer of any decisions not to file a nonprovisional patent application, continue the prosecution of a patent application, pay maintenance fees, or defend in a reexamination or opposition proceeding on a patent, in any country, not less than 30 days before the expiration of the response or filing period required by the relevant patent office.
- (4) The Contractor shall include, within the specification of any United States nonprovisional patent or plant variety protection application and any patent or plant variety protection certificate issuing thereon covering a subject invention, the following statement, "This invention was made with Government support under (identify the contract) awarded by (identify the agency). The Government has certain rights in the invention."
- (f) Reporting on utilization of subject inventions. The Contractor shall submit, on request, periodic reports no more frequently than annually on the utilization of a subject invention or on efforts at obtaining utilization of the subject invention that are being made by the Contractor or its licensees or assignees. The reports shall include information regarding the status of development, date of first commercial sale or use, gross royalties received by the Contractor, and other data and information as the agency may reasonably specify. The Contractor also shall provide additional reports as may be requested by the agency in connection with any march-in proceeding undertaken by the agency in accordance with paragraph (h) of this clause. The Contractor also shall mark any utilization report as confidential/proprietary to help prevent inadvertent release outside the Government. As required by 35 U.S.C. 202(c)(5), the agency will not disclose that information to persons outside the Government without the Contractor's permission.
- (g) Preference for United States industry. Notwithstanding any other provision of this clause, neither the Contractor nor any assignee shall grant to any person the exclusive right to use or sell any subject invention in the United States unless the person agrees that any products embodying the subject invention or produced through the use of the subject invention will be manufactured substantially in the United States. However, in individual cases, the requirement for an agreement may be waived by the agency upon a showing by the Contractor or its assignee that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States, or that under the circumstances domestic manufacture is not commercially feasible.
- (h) March-in rights. The Contractor acknowledges that, with respect to any subject invention in which it has retained ownership, the agency has the right to require licensing pursuant to 35 U.S.C. 203 and 210(c), and in accordance with the procedures in 37 CFR 401.6 and any supplemental regulations of the agency in effect on the date of contract award.
- (i) Special provisions for contracts with nonprofit organizations. If the Contractor is a nonprofit organization, it shall--
- (1) Not assign rights to a subject invention in the United States without the written approval of the agency, except where an assignment is made to an organization that has as one of its primary functions the management of inventions, provided, that the assignee shall be subject to the same provisions as the Contractor;
- (2) Share royalties collected on a subject invention with the inventor, including Federal employee co-inventors (but through their agency if the agency deems it appropriate) when the subject invention is assigned in accordance with 35 U.S.C. 202(e) and 37 CFR 401.10;

- (3) Use the balance of any royalties or income earned by the Contractor with respect to subject inventions, after payment of expenses (including payments to inventors) incidental to the administration of subject inventions for the support of scientific research or education; and
- (4) Make efforts that are reasonable under the circumstances to attract licensees of subject inventions that are small business concerns, and give a preference to a small business concern when licensing a subject invention if the Contractor determines that the small business concern has a plan or proposal for marketing the invention which, if executed, is equally as likely to bring the invention to practical application as any plans or proposals from applicants that are not small business concerns; provided, that the Contractor is also satisfied that the small business concern has the capability and resources to carry out its plan or proposal. The decision whether to give a preference in any specific case will be at the discretion of the Contractor.
- (5) Allow the Secretary of Commerce to review the Contractor's licensing program and decisions regarding small business applicants, and negotiate changes to its licensing policies, procedures, or practices with the Secretary of Commerce when the Secretary's review discloses that the Contractor could take reasonable steps to more effectively implement the requirements of paragraph (i)(4) of this clause.

(i) Communications.

All written notifications required by this clause shall be submitted to the Administrative Contracting Officer (ACO). All required reporting shall be accomplished using the i-Edison.gov reporting website (https://sedison.info.nih.gov/iEdison/).

Final patent report will be submitted in hard copy to the Administrative Contracts Officer (ACO) and Procurement Contract Officer (PCO) designated herein until such time that iEdison allows for electronic submission.

- (k) Subcontracts. (1) The Contractor shall include the substance of this clause, including this paragraph (k), in all subcontracts for experimental, developmental, or research work to be performed by a small business concern or nonprofit organization.
- (2) The Contractor shall include in all other subcontracts for experimental, developmental, or research work the substance of the patent rights clause required by FAR Subpart 27.3.
- (3) At all tiers, the patent rights clause must be modified to identify the parties as follows: references to the Government are not changed, and the subcontractor has all rights and obligations of the Contractor in the clause. The Contractor shall not, as part of the consideration for awarding the subcontract, obtain rights in the subcontractor's subject inventions.
- (4) In subcontracts, at any tier, the agency, the subcontractor, and the Contractor agree that the mutual obligations of the parties created by this clause constitute a contract between the subcontractor and the agency with respect to the matters covered by the clause; provided, however, that nothing in this paragraph is ntended to confer any jurisdiction under the Contract Disputes Act in connection with proceedings under paragraph (h) of this clause.

(End of clause)

52.233-4 APPLICABLE LAW FOR BREACH OF CONTRACT CLAIM (OCT 2004)

United States law will apply to resolve any claim of breach of this contract.

(End of clause)

52.247-1 COMMERCIAL BILL OF LADING NOTATIONS (FEB 2006)

When the Contracting Officer authorizes supplies to be shipped on a commercial bill of lading and the Contractor will be reimbursed these transportation costs as direct allowable costs, the Contractor shall ensure before shipment is made that the commercial shipping documents are annotated with either of the following notations, as appropriate:

(a) If the Government is shown as the consignor or the consignee, the annotation shall be:

"Transportation is for the <u>Defense Advanced Research Projects Agency (DARPA)</u> and the actual total transportation charges paid to the carrier(s) by the consignor or consignee are assignable to, and shall be reimbursed by, the Government."

(b) If the Government is not shown as the consignor or the consignee, the annotation shall be:

"Transportation is for the <u>Defense Advanced Research Projects Agency (DARPA)</u> and the actual total transportation charges paid to the carrier(s) by the consignor or consignee shall be reimbursed by the Government, pursuant to cost-reimbursement contract no. HR011-09-C-0028. This may be confirmed by contacting the Administrative Contracting Officer at DCMA Virginia"

(End of clause)

52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

http://farsite.hill.af.mil

(End of clause)

52.252-6 AUTHORIZED DEVIATIONS IN CLAUSES (APR 1984)

- (a) The use in this solicitation or contract of any Federal Acquisition Regulation (48 CFR Chapter 1) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the date of the clause.
- (b) The use in this solicitation or contract of any <u>Defense Federal Acquisition Regulation Supplement</u> (48 CFR <u>chapter 2</u>) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

(End of clause)

252.235-7010 Acknowledgment of Support and Disclaimer. (MAY 1995)

- (a) The Contractor shall include an acknowledgment of the Government's support in the publication of any material based on or developed under this contract, stated in the following terms: This material is based upon work supported by the Defense Advanced Research Projects Agency (DARPA) under Contract No. HR0011-09-C-0028.
- (b) All material, except scientific articles or papers published in scientific journals, must, in addition to any notices or disclaimers by the Contractor, also contain the following disclaimer: Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the Defense Advanced Research Projects Agency (DARPA), U.S. Department of Defense (DoD) or U.S. Government.

Section J - List of Documents, Exhibits and Other Attachments

LIST OF ATTACHMENTS

DOCUMENT TYPE	PAGES	DATE
Attachment 1 – Statement of Work	5	15 September 2008
Attachment 2 – COR Letter	3	30 September 2008

Statement of Work for Revolution in Fiber Lasers (RIFL) by FIBERTEK, Inc.

15 September 2008

1.0 Research Objectives & General Program Scope:

The objective of the RIFL program is to scale fiber laser amplifiers to > 1 kW in Phase 1, and then to explore scaling fiber laser amplifiers to > 3kW in Phase 2. In each case the high power output of the fiber laser amplifier shall be single-mode, polarization-maintaining, and narrow linewidth (consistent with coherent combination of multiple fiber laser amplifiers).

Fibertek, Inc. will utilize a systematic and integrated approach to the design, realization and test demonstration of multi-kW SF, SP, SM all-fiber-MOPA at $1\mu m$, via innovations in:

- efficient high Yb-doped fibers, with large core/clad ratio for short length (< 3 m) operation
- scaling of mode area, while ensuring mode-discrimination *via* Yb-doping profile and refractive-index profile tailoring
- effective thermal management methods for added SBS mitigation
- advanced fiber fabrication method, pioneered by ideally suited for the precise fabrication of above such fibers (partnered with
- scaling of high-brightness fiber-coupled LD pumps to kW-levels, by combining advances in emitter power density and beam-combining methods (partnered with
- robust fiber-optic components (e.g. fused PM-combiners, isolators with integrated filters, improved fiber-ends, etc.) capable of high-power operation in MOPA-chains producing multi-kW output (vendors: ITF Labs, EM4 Inc. and OFR Inc.)
- advanced fiber fusion-splicing methods for such large dual-clad PM fibers, to produce low-loss and 'mode-matched' launch conditions in 'all-fiber' configuration (vendor: Fujikura)

To accomplish the above program objectives, Fibertek, Inc. will design, develop and implement a 'breadboard' laboratory demonstration of an 'all-fiber' MOPA system operating cw at $\lambda \sim 1064$ nm, producing ≥ 1 kW cw power output in a single-frequency, diffraction limited, single-polarization beam. Drive and control/monitoring electronics will be housed in standard 19" rack equipment. This MOPA system will use a combination of passive (conduction) cooling and TE-cooling/fan-cooling. However, 'breadboard' water-cooling may be used to reject heat to ambient. A two-step approach will be used – a 'free-space' interconnected version, especially for final MOPA stage, to facilitate design engineering, evaluation and performance assessment. With increasing confidence, an 'all-fiber' version will be assembled and tested in parallel, to mitigate program schedule risks. This system will be set-up, tested and available for extended review by the program review panel team, in a 'clean environment' facility within Fibertek, Inc.

Fibertek, Inc. will develop a RIFL solution based on a multi-stage fiber-MOPA system, using suitably design-engineered high-Yb-doped LMA fibers, as developed by (nLight), in this program. Appropriate high-power high-brightness fiber-coupled pump source will developed by An 'all-fiber' version of the system will be implemented by design optimization and extension of current state-of-art in fused-fiber pump combiners and mode-field adapters, fiber-pigtailed optical isolators with integrated rejection filters, and precision fusion-slicing for large-diameter PM fibers, by working with various subcontractors/vendors; Avensys/ITF Labs, OFR Inc. & EM4 Inc., and AFL-Telecom/Fujikura, respectively. Fibertek, Inc. will achieve technical risk mitigation through multiple design points. Teaming/Supplier risk mitigation will be achieved by working in parallel, but in a much reduced scope, with differing technology/approaches and suppliers.

Fibertek, Inc. shall allow Government representatives to witness any tests deemed necessary in order to validate performance consistent with the metrics delineated in this SOW. The final disposition of the hardware developed by Fibertek, Inc. will be determined during the course of Phase II, if the Phase II option is exercised. The Government will, at that time, notify Fibertek, Inc. of its intent regarding the delivery of any such hardware, to include providing delivery location, if the Government chooses to exercise its right to have the resulting hardware items delivered.

2.0 Milestones & Technical Tasks

2.1 Milestones

#	Phase 1 Milestones	Month
1	Demonstrate multi-stage fiber-MOPA producing P~10W, and retaining all coherence properties of the seed 1 μ m laser source (<100kHz linewidth, M² ~ 1.1, PER \geq 20 dB)	4
2	Demonstrate P>100W power operation (<100kHz linewidth, $M^2 \le 1.4$, PER ≥ 20 dB) using the baseline Yb1200-30/250 dual-clad PM fiber	6
3	Demonstration of high-efficiency Yb1200-50/250 DC-PM fibers	9
4	Demonstrate P>5W, pathfinder unit of fiber-optic isolator, ASE-filter, polarizer	9
5	Demonstration of 600W (200μm/0.22NA) fiber coupled LD pump	12
6	Demonstrate ~400W power operation (<100kHz linewidth, M²≤2, PER≥20dB) using Yb1200-50/250 DC-PM fibers	12
7	Demonstrate 1x3 combined fiber-coupled Pump using multiple 600W units of (#3) for P ≥ 1.5kW, for coupling to 250um/0.46NA Yb-doped fibers	15
8	P≥1kW operation (<100kHz linewidth, M²≤1.4, PER≥20 dB), efficiency~15% runtime~200sec, lifetime>100hrs (extrapolated from accum. runtime)	18
	Phase 2 Milestones	Month
9	Demonstrate P>20W capable fiber-optic isolators, ASE filters, polarizers	21
10	Develop & demonstrate multi-kW fiber-coupled pumps (P≥2 kW), either through 1xN combining, or from 400μm/0.22NA fiber	24
11	Development & demonstration of high-efficiency Yb1200 80/400 DC-PM fibers (or similar fiber design)	27

12	P≥3kW operation (<100kHz linewidth, M²≤1.4, PER≥20 dB), efficiency>20%	33
	runtime~200sec, lifetime>100hrs (extrapolated from accum. runtime)	

2.2 Phase 1 Tasks

Fibertek, Inc.

- (1) Detailed design modeling and assessment of fiber-MOPA system and its key components (optical fiber, LD pumps, pump combiner, etc.) in support of Phase I milestone. Alternate design points will be specifically obtained. This task is an extension of the methodology described in this proposal. Interdependent parameters will be specifically included.
- (2) Design, modeling and separate experimental verification of MOPA thermal management system in support of an optimized scheme for thermal-gradient induced SBS mitigation.
- (3) Initial assessment and verification of individual components for cw operation to respective power levels estimated for the final power amplifier stage of the MOPA system, e.g. optical fiber ends, LD pumps, Pump combiners, Isolators, etc.
- (4) Baseline fiber-MOPA system set-up using currently available optimized fiber based on same optical fiber fabrication (DND) process (*i.e.* based on using commercially available Liekki Yb1200-30/250μm 0.07NA-DC-PM). Improved & quantitative PM-fiber splicing method will be used, based on actively-controlled PM fusion splicing from AFL/Fujikura.
- (5) Assemble and test a 'free-space' connected version of the final stage of MOPA design point, to assess performance against the predicted/estimated parameters, as well as Phase I milestone. Revise design points and optimize aspects of above steps (as needed) to optimize measured performance against Phase I milestone
- (6) Assemble and test an "all-fiber" version of the final design point for kW class MOPA system, producing a highly coherent output per the Phase I milestone. Make it available for on-site test evaluation by an external review panel.
- (7) Program management, interaction and supply of partners/subcontractors for key component development tasks. Communicate technical, program & financial status to DARPA.

- (8) Supply to Fibertek, non-PM polymer-clad version of Yb1200-50/250µm-0.07NA-DC fiber (this is based on existing Liekki design for advanced (non-commercial) fibers)
- (9) Supply to Fibertek, non-PM polymer-clad version of Yb1200-80/400μm-0.07NA-DC fiber (this is based on existing Liekki design for advanced (non-commercial) fibers)
- (10) Optimize process for all glass-clad fibers to reach ≥ 0.25 NA for the inner-clad.
- (11) Develop & fabricate non-PM all-glass-clad Yb1200-50/250/300μm-0.07NA-DC fiber
- (12) Further enhancement of R.I. & doping-profile control tolerance, via process improvement
- (13) Develop & fabricate modified RI-index & Yb-doping profile, for fiber from task 11
- (14) Develop & fabricate PM version of fiber from task 13
- (15) Software development & integration (working in conjunction with Fibertek, Inc.)

(16) Assemble, test & supply to Fibertek, Qty = 2 of 200W, 200μm 0.22NA fiber-coupled 976nm high-power LD pumps. Extend to prototype a 400W, 400μm, 0.22NA, pump.

- (17) Optimize laser-bar design & assembly and extend architecture of beam-combining to demonstrate prototype of 600W/200µm/0.22NA, fiber-coupled 976nm LD pumps
- (18) Assemble, test and deliver to Fibertek, Qty=3 of 600W, 200μm 0.22NA, fiber-coupled 976 nm high-power LD pumps

Others

- (19) OFR, Inc.: high-power isolators up to 30W and beyond, with fiber-pigtails
- (20) EM4, Inc.: fiber-pigtail and innovative fiber-end preparation for high cw powers, and 'compensated' high-power isolator designs
- (21) Work with nLight Corp. (sub-contracted) to develop and demonstrate alternate approach to (single-emitter LD chips based) compact high-brightness fiber-coupled pumps

2.3 Phase 2 Tasks

Fibertek, Inc.

- (22) Review and re-assess design path to be selected for Phase II milestone demonstration.
- (23) Optimize and implement fiber thermal management scheme for "80/400µm" fiber
- (24) Assessment and verification of individual components for cw operation to respective power levels estimated for the final power amplifier stage of the MOPA system, e.g. optical fiber ends, LD pumps, Pump combiners, Isolators, etc.
- (25) Revised multi-stage MOPA system (an additional YDFA-amplifer stage is needed so as to be capable of producing high-enough signal power input (≥30W), so as to limit gain to ≤20dB for the final power amplification stage to achieve ≥ 3 kW coherent power output
- (26) Assemble & test free-space coupled version of final power amplifier stage
- (27) Assemble and test an "all-fiber" version of the final design point for kW class MOPA system, producing a highly coherent output per the Phase II milestone. Make it available for on-site test evaluation by an external review panel.
- (28) Program management, interaction and supply of partners/subcontractors for key component development tasks. Communicate technical & program status to DARPA.

- (29) Develop & fabricate non-PM all-glass-clad Yb1200-80/400/460µm-0.07NA-DC fiber
- (30) Develop & fabricate modified RI-index & Yb-doping profile, for fiber from task 29
- (31) Develop & fabricate PM version of fiber from task 30
- (32) Process optimization for higher dopings (i.e. Yb2000), with low photo-darkening
- (33) Other custom fiber per evolving program requirements (e.g. 100μm core, SBS mitigation via acoustic anti-guiding)

- (34) Assemble/Test/Deliver Qty=6 of previously developed 600W/200µm,0.22NA pumps
- (35) Multi-kW (>2kW), 400μm,0.22NA fiber-coupled 976nm pumps (i) design & process development, (ii) prototype build & test
- (36) Assemble/Test and deliver 2 more above pump units from task 35

Others

- (37) Avensys/ITF Labs: Improved prototypes (Qty=2) of their kW pump combiners for ≥ 2 kW, with 80/400/460µm,0.22NA output fiber
- (38) EM4, Inc. OR OFR, Inc.: select preferred supplier to continue work on fiber-pigtailed (isolator + integrated filters) to > 50 W cw power handling capability
- (39) nLight: continued work on alternate approach to compact high-brightness 976 nm fiber-coupled pump 'demonstrator' unit
- (40) Program Closure Fibertek, Inc.

3.0 Program Management

Fibertek, Inc. shall provide oversight of all development activities, including those to be performed by subcontractor and/or outside vendors, to ensure cost and schedule compliance in accordance with the basic contract. Fibertek, Inc. shall be prepared to support a kickoff meeting at the contractor's facility and support periodic reporting and offsite program reviews, including the final reports.

Fibertek, Inc. shall support/host up to two (2) weeks of on-site performance testing by a Government team at the end of both Phase I and Phase II.

Fibertek, Inc. shall allow Government representatives to witness any contractorperformed tests that will be carried out, as scheduled, in order to validate performance consistent with the metrics delineated in this SOW. Fibertek, Inc. shall coordinate such test activities with the Contracting Officer's Representative (COR) to allow the Government the opportunity to witness such tests on-site as they are being conducted.

4.0 Program (Phase I and II) Deliverables

	Deliverables		Yea	ır 1			Yea	ar 2			Ye	ar 3	
	Deliverables	1	2	3	4	1	2	3	4	1	2	3	4
1	Design + Test results on all prior stages		X										
2	Design + Test result on 30/250 hp-MOPA		X										
3	Design + Test result on 50/250 hp-MOPA					X							
4	Thermal management design & test (via FBG)				Х								×.
5	600W fiber-coupled(200u/0.22NA) LD pump					X							
6	Fiber-optic Isolator + ASE-filter (10,30,50W)				X		X		X				
7	Milestone 1 : RIFL Phase-I demo						X						
8	Design & Test demo of 80/400 f-MOPA								X				
9	Design & Test of glass-clad 80/400 f-MOPA									X			
10	Multi-kW fiber-coupled pump in 400u fiber									X			
11	Milestone 2 : RIFL Phase-II demo										Х		
,	Reports												
a	Technical Summary Report	X	Х	Х	Х	Х	Х	Х	X	X	Х		
b	Cost Summary Report	Х	Х	X	Х	Х	X	X	X	Х	Х		
С	Progress Report (X) & Program Report (X)				X		X		X			X	95

Note: (1)All deliverables in last week of indicated quarter from start of program (2)hp-MOPA=high-power MOPA Note (2) Phase I and II Final Reports, interim technical reports, and interim cost reports shall be provided as required by Sections C and F of the contract.



DEFENSE ADVANCED RESEARCH PROJECTS AGENCY 3701 NORTH FAIRFAX DRIVE ARLINGTON, VA 22203-1714

MEMORANDUM FOR CONTRACTING OFFICER'S REPRESENTATIVE

FROM:

DARPA, Contracts Management Office

TO:

Frank Hanson, SPAWAR

SUBJECT:

Appointment as Contracting Officer's Representative (COR)

1. You are hereby appointed as the Contracting Officer's Representative for the below Revolution in Fiber Lasers (RIFL) Contract:

	RIFL	Awardee	Contract No.
Fibertek, Inc.			HR0011-09-C-0028

- 2. This appointment authorizes and designates you to perform the following duties and/or responsibilities as specified herein:
 - a. Furnish plans, schedules, specifications, descriptions, and other documents to the contractor as required by the contract.
 - b. Assist the contractor in interpreting technical aspects of the contract specifications/statement of work. Differences of opinion and interpretations which could affect the terms and conditions of the contract will be referred to the contracting officer for resolution.
 - c. Provide Government recommendations/approvals to the contractor promptly in all cases where the contract calls for technical approval.
 - d. Observe, monitor, and assess the contractor's performance under the terms of the contract. This includes reporting promptly to the contracting officer any failures, delays, or significant deviations of performance, quality, costs, or other actions which might jeopardize contract performance.
- 3. In the performance of the duties delegated to you in this letter, you are cautioned that you could be held personally liable for actions taken or directions given by you to the contractor that are beyond the authorities given to you in this letter. The duties or authorities in this letter are not delegable; therefore, you must advise the Contracting Officer or the Contract Administrator/Specialist immediately when you are unable to perform these duties.
- 4. In your dealings with the contractor you must not give technical direction as though the contractor's employees are Government employees. You must maintain a formal, armslength relationship with the contractor in order to avoid even an appearance that the contract

Contract: HR0011-09-C-0028 COR Appointment Memorandum Attachment (2) Page 2 of 3

is one for personal services. If the contractor's performance takes place in a Government facility, then to the maximum extent practicable, the contractor's work area should be physically separated from areas in which Government employees work, and communication with the contractor's employees on contractual matters should be only through that contractor employee(s) designated by the contractor to supervise them. You must not give any direction to the contractor that is not authorized by the statement of work because it is not the intent of the Government that a contractor be required to do anything that is not included in the contract.

- 5. You are responsible for providing prompt notification to the contracting officer any significant deficiencies with respect to contractor performance or other actions which might jeopardize contract performance.
- 6. You are not authorized by this letter to take any action, either directly or indirectly, that could result in a change in the pricing, quantity, quality, place of performance, delivery schedule or any other terms and conditions of the basic contract, or to direct the accomplishment of effort which would exceed the scope of the basic contract. You must be especially cautious in providing interpretation of the specifications/ statement of work. The agreement reached or technical direction given must be formalized in writing with copies to the contracting officer. You shall also inform the contractor that if he believes that the COR's interpretation is erroneous, the contractor must notify the contracting officer in writing concerning the details of his position.
- 7. Specific duties in addition to those above are as follows:
 - a. Control all government technical interfaces with the contractor.
 - b. Ensure that copies of government technical correspondence are forwarded to the contracting officer for placement in the contract file unless otherwise posted to TFIMS by the contractor in accordance with the contract.
 - c. Promptly furnish documentation on any requests for change, deviation, or waiver (whether generated by the Government or the contractor) to the contracting officer for appropriate action.
 - d. Review and, if required (i.e., Fixed Price Payments), accept invoices submitted through WAWF as stipulated in Section G of the Contract.
 - e. Provide required review of Patent/Invention Disclosures made in I-Edison (http://www.iedison.gov).
 - f. The COR must maintain a separate file for each contract for which he/she acts as COR. The file should serve as a repository and record of all documents and communications between the contractor and the COR. At a minimum, the file must

Contract: HR0011-09-C-0028 COR Appointment Memorandum Attachment (2) Page 3 of 3

include a copy of the contract and all modifications as well as the COR appointment letter. Examples of other file documentation may include:

- Reports required per the contract, c.g. interim and final technical or patent reports
- Memoranda for Record documenting important contract discussions
- Records of formal meetings, e.g. post award conserence, program reviews, etc.
- g. Assist ACO and/or PCO, as requested, with closeout activities at completion of contract period of performance.
- 8. If this is your first appointment as a COR or if you have not performed COR duties within the last two years, and in order to comply with DFARS 201.6-2, you must complete COR training immediately so that you can properly execute your responsibilities under this contract. A good source of COR training is available via a web-based module, CLC 106, "Contracting Officer Representative with a Mission Focus" at www.dau.mil.
- 9. Your appointment as COR for this effort expires on final disposition of the contract.
- 10. Your good judgment in performing your duties under the contract will have an important effect on the value of the performance obtained by the Government.

(b)(6)	Finh Home
DARPA PCO Contracting Officer	Appointee Contracting Officer's Representative
9/30/08	9/30/08
Date	Date

AMENDMENT OF SOLICITA	A TION/MODIE	ICATION OF CONTRACT	1. CONTRACT I	D CODE	PAGE OF PAGES
AMENDMENT OF SOLICITA	ATTOM/MODIF	ICATION OF CONTRACT	U		1 3
2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.		5. PROJECTN	O.(Ifapplicable)
P00001	06-Nov-2008	SEE SCHEDULE			
6. ISSUED BY CODE	HR0011	7. ADMINISTERED BY (Ifother than item6)	COD	E S2404	A
DARPA		DCMA VIRGINIA 10500 BATTLEVIEW PARKWAY			
CMO ATTN: MICHAEL D. BLACKSTONE		SUITE 200 MANASSAS VA 20109-2342			
3701 N. FAIRFAX DR. ARLINGTON VA 22203-1714		WINE VIOLENT VIOLENTE			
			TO A A MENTO ME	NIE OF COL	ICIT ATIONING
 NAME AND ADDRESS OF CONTRACT OR FIBERTEK, INC. 	(No., Street, County, S	tate and Zip Code)	9A. AMENDME	NI OF SOL	ICITATION NO.
510 HERNDON PKWY HERNDON VA 20170-5225			9B. DATED (SE	E ITEM 11))
			× 10A. MOD. OF 0	CONTRACT 028	/ORDER NO.
			10B. DATED (S	EE ITEM 1	3)
CODE 8Y519	FACILITY COD	B	X 02-Oct-2008		
11.	THISITEM ONLY A	PPLIES TO AMENDMENTS OF SOLI	CITATIONS		
The above numbered solicitation is amended as set forth	in Item 14. The hour and d	ate specified for receipt of Offer	is extended,	is not extend	led.
Offer must acknowledge receipt of this amendment prio		-	-		
(a) By completing Items 8 and 15, and returning or (c) By separate letter or telegram which includes a re	— '	; (b) By acknowledging receipt of this amendment			
RECEIVED AT THE PLACE DESIGNATED FOR TH				O BL	
REJECTION OF YOUR OFFER. If by virtue of this are				er,	
provided each telegram or letter makes reference to the s 12. ACCOUNTING AND APPROPRIATION DA		rent, and is received prior to the opening nour a	nd date specified.		
See Schedule	A (II required)				
	M APPLIES ONLY TO	O MODIFICATIONS OF CONTRACTS	VORDERS	· · · · · · · · · · · · · · · · · · ·	
		T/ORDER NO. AS DESCRIBED IN ITE			
A. THIS CHANGE ORDER IS ISSUED PURSU CONTRACT ORDER NO. IN ITEM 10A.	ANT TO: (Specify au	thority) THE CHANGES SET FORTH	IN ITEM 14 ARE MA	ADE IN THI	Е
B. THE ABOVE NUMBERED CONTRACT/O office, appropriation date, etc.) SET FORT	RDER IS MODIFIED T H IN ITEM 14, PURS	TO REFLECT THE ADMINISTRATIV UANT TO THE AUTHORITY OF FAI	/E CHANGES (such as R 43.103(B).	changes in	paying
C. THIS SUPPLEMENT AL AGREEMENT IS	ENTERED INTO PUR	RSUANT TO AUTHORITY OF:			
D. OTHER (Specify type of modification and a	and hamiter)				
Unilateral IAW Limitation of Funds Clause 52.2					
E. IMPORTANT: Contractor X is not,	is required to sign	this document and return	copies to the issuing	office.	
4. DESCRIPTION OF AMENDMENT/MODIFIC	CATION (Organized b	y UCF section headings, including solici	tation/contract subjec	t matter	
where feasible.)					
Modification Control Number: mvessill0996 The purpose of this modification is to provide in		the amount of \$2.599,000 (A.O: X670/	14 ACRN: AR) for B	hasa Lof the	_
RIFL program. See page two (2).	crementarranding, in	the amount of \$2,599,000 (AC. A070)	14, AGN. AB), 101 1	ilase i Oi tili	5
					}
·					
except as provided herein, all terms and conditions of the doc	ument referenced in Item 9 A	or 10A, as heretofore changed, remains unchan-	ged and in full force and eff	fect.	
5A. NAME AND TITLE OF SIGNER (Type or p		16A. NAME AND TITLE OF CON			print)
		MICHAEL D. BLACKSTONE / PCO TEL: (571) 218-4804	EMAIL: michael.blacks	tone@dorne mil	
5B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMER			DATE SIGNED
22. CONTINUE OF THE PROPERTY O	150, DATE BIGHED				
(Signature of person authorized to sign)		(Signature of Contracting Offi	cer)	06-1	Nov-2008
(grand or person aumorized to sign)	L	(Seguinate of Contracting Offi	,	I	

SUMMARY OF CHANGES

The purpose of modification P00001 to Contract No. HR0011-09-C-0028 is to provide incremental funding for Phase I of the RIFL effort. Said contract is hereby revised as follows:

1. SECTION B - SUPPLIES OR SERVICES AND PRICES

SUBCLIN 000102 is added as follows:

ESTIMATED FIXED COST PLUS
COST FEE FIXED FEE

ITEM NO SUPPLIES/SERVICES

000102 Funding for C

Funding for CLIN 0001 only AO No. X670/14

ACRN AB

\$2,599,000.00

UIC

SECTION F - DELIVERIES OR PERFORMANCE

The following Delivery Schedule item has been added to SUBCLIN 000102:

This bearing beneate from the over about to be believe to the

DELIVERY DATE QUANTITY SHIP TO ADDRESS

02-APR-2010 SPAWAR SYSTEMS CENTER SAN DIEGO N00039

DR. FRANK HANSON SPAWARSYSCEN 55430 53490 DOW STREET SAN DIEGO CA 92152-5743

(619) 553-2094 FOB: Destination

3. SECTION G - CONTRACT ADMINISTRATION DATA

Accounting and Appropriation

Summary for the Payment Office

As a result of this modification, the total funded amount for this document was increased by \$2,599,000.00 from \$553,000.00 to \$3,152,000.00.

SUBCLIN 000102:

Funding on SUBCLIN 000102 is initiated as follows:

ACRN: AB

Acctng Data: 9790400 1320 X670 P9G10 2525 DPAC 9 5064 S12136 62702E

Increase: \$2,599,000.00

Total: \$2,599,000.00

- 4. G-6 Clause G-6, "Incremental Funding," is revised as indicated in bold below:
 - (a) This contract shall be subject to incremental funding, as indicated in the table below, which is presently made available for performance under this contract. It is estimated that the funds presently available are sufficient to permit the Contractor's performance through the performance end dates indicated in the table below. Except in accordance with the Section I clause FAR 52.232-22, "Limitation of Funds," no legal liability of the part of the Government for payment of any money in excess of the funds listed in the table below shall arise unless and until additional funds are made available by the Contracting Officer through a modification to this contract.

Phase	<u>CLIN</u> 0001	Funding Provided to Date \$3,152,000	Funding Period of Performance End Date 31 December 2009
2	0002	TBD	TBD

5. Except as modified herein, all terms and conditions of Contract No. HR0011-09-C-0028 shall remain in full force and effect.

AMENDMENT OF S	OF TOTT	ATTONIATORI	DICATION OF CONTRACT		I. CONTRAC	TID CODE	PAGE OF PAGES
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P00002		08-Dec-2008	SEE SCHEDULE				
. ISSUED BY	CODE	HR0011	7. ADMINISTERED BY (Ifother than item6)		C	DDE S24	04A
DARPA			DCMA VIRGINIA 10500 BATTLEVIEW PARKWAY				1.44
СМО			SUITE 200				
ATTN: MICHAELD. BLACKSTONE 3701 N. FAIRFAX DR.			MANASSAS VA 20109-2342				
ARLINGTON VA 22203-1714							
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510 HERNDON PKWY HERNDON VA 20170-5225				9	B. DATED (SEE ITEM	11)
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The above numbered solicitation is ame	nded as set for	rth in Item 14. The hour and	d date specified for receipt of Offer	is	extended,	is not ex	tended.
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(a) By completing Items 8 and 15, and r			ent; (b) By acknowledging receipt of this amendmen		_		l;
or (c) By separate letter or telegram whi	ich includes a	reference to the solicitation	n and amendment numbers. FAILURE OF YOUR A	CKNO	WLEDGMEN		
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SUMMARY OF CHANGES

HR0011-09-C-0028 is hereby revised as bolded below:

1. SECTION J - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

LIST OF ATTACHMENTS

DOCUMENT TYPE Attachment 1 – Statement of Work – Rev 1	PAGES 5	<u>DATE</u> 24 November 2008
Attachment 2 – COR Letter	3	30 September 2008

2. Except as modified herein, all terms and conditions of Contract No. HR0011-09-C-0028 shall remain in full force and effect.

Statement of Work for Revolution in Fiber Lasers (RIFL) by FIBERTEK, Inc.

Revision 1 - 24 November 2008

1.0 Research Objectives & General Program Scope:

The objective of the RIFL program is to scale fiber laser amplifiers to > 1 kW in Phase 1, and then to explore scaling fiber laser amplifiers to > 3kW in Phase 2. In each case the high power output of the fiber laser amplifier shall be single-mode, polarization-maintaining, and narrow linewidth (consistent with coherent combination of multiple fiber laser amplifiers).

Fibertek, Inc. will utilize a systematic and integrated approach to the design, realization and test demonstration of multi-kW SF, SP, SM all-fiber-MOPA at 1µm, via innovations in:

- efficient high Yb-doped fibers, with large core/clad ratio for short length (< 3 m) operation
- scaling of mode area, while ensuring mode-discrimination *via* Yb-doping profile and refractive-index profile tailoring
- effective thermal management methods for added SBS mitigation
- advanced fiber fabrication method, pioneered by ideally suited for the precise fabrication of above such fibers (partnered with
- scaling of high-brightness fiber-coupled LD pumps to kW-levels, by combining advances in emitter power density and beam-combining methods (partnered with
- robust fiber-optic components (e.g. fused PM-combiners, isolators with integrated filters, improved fiber-ends, etc.) capable of high-power operation in MOPA-chains producing multi-kW output (vendors: ITF Labs, EM4 Inc. and OFR Inc.)
- advanced fiber fusion-splicing methods for such large dual-clad PM fibers, to produce low-loss and 'mode-matched' launch conditions in 'all-fiber' configuration (vendor: Fujikura)

To accomplish the above program objectives, Fibertek, Inc. will design, develop and implement a 'breadboard' laboratory demonstration of an 'all-fiber' MOPA system operating cw at $\lambda \sim 1064$ nm, producing ≥ 1 kW cw power output in a single-frequency, diffraction limited, single-polarization beam. Drive and control/monitoring electronics will be housed in standard 19" rack equipment. This MOPA system will use a combination of passive (conduction) cooling and TE-cooling/fan-cooling. However, 'breadboard' water-cooling may be used to reject heat to ambient. A two-step approach will be used – a 'free-space' interconnected version, especially for final MOPA stage, to facilitate design engineering, evaluation and performance assessment. With increasing confidence, an 'all-fiber' version will be assembled and tested in parallel, to mitigate program schedule risks. This system will be set-up, tested and available for extended review by the program review panel team, in a 'clean environment' facility within Fibertek, Inc.

Fibertek, Inc. will develop a RIFL solution based on a multi-stage fiber-MOPA system, using suitably design-engineered high-Yb-doped LMA fibers, as developed by (nLight), in this program. Appropriate high-power high-brightness fiber-coupled pump source will developed by An 'all-fiber' version of the system will be implemented by design optimization and extension of current state-of-art in fused-fiber pump combiners and mode-field adapters, fiber-pigtailed optical isolators with integrated rejection filters, and precision fusion-slicing for large-diameter PM fibers, by working with various subcontractors/vendors; Avensys/ITF Labs, OFR Inc. & EM4 Inc., and AFL-Telecom/Fujikura, respectively. Fibertek, Inc. will achieve technical risk mitigation through multiple design points. Teaming/Supplier risk mitigation will be achieved by working in parallel, but in a much reduced scope, with differing technology/approaches and suppliers.

Fibertek, Inc. shall allow Government representatives to witness any tests deemed necessary in order to validate performance consistent with the metrics delineated in this SOW. The final disposition of the hardware developed by Fibertek, Inc. will be determined during the course of Phase II, if the Phase II option is exercised. The Government will, at that time, notify Fibertek, Inc. of its intent regarding the delivery of any such hardware, to include providing delivery location, if the Government chooses to exercise its right to have the resulting hardware items delivered.

2.0 Milestones & Technical Tasks

2.1 Milestones

#	Phase 1 Milestones	Month
1	Demonstrate multi-stage fiber-MOPA producing P~10W, and retaining all coherence properties of the seed 1μm laser source (<100kHz linewidth, M² ~ 1.1, PER ≥ 20 dB)	4
2	Demonstrate P>100W power operation (<100kHz linewidth, $M^2 \le 1.4$, PER ≥ 20 dB) using the baseline Yb1200-30/250 dual-clad PM fiber	6
3	Demonstration of high-efficiency Yb1200-50/250 DC-PM fibers	9
4	Demonstrate P≥10W, pathfinder unit of fiber-optic isolator, ASE-filter, polarizer	9
5	Demonstration of 600W (200μm/0.22NA) fiber coupled LD pump	12
6	Demonstrate ~400W power operation (<100kHz linewidth, M²≤2, PER≥20dB) using Yb1200-50/250 DC-PM fibers	12
7	Demonstrate 1x3 combined fiber-coupled Pump using multiple 600W units of (#3) for P ≥ 1.5kW, for coupling to 250um/0.46NA Yb-doped fibers	15
8	P≥1kW operation (<100kHz linewidth, M²≤1.4, PER~17-20 dB), efficiency ~15% runtime~200sec, lifetime>100hrs (extrapolated from accum. runtime)	18
	Phase 2 Milestones	Month
9	Demonstrate P≥20W capable fiber-optic isolators, ASE filters, polarizers	21
10	Develop & demonstrate multi-kW fiber-coupled pumps (P≥2 kW), either through 1xN combining, or from 400μm/0.22NA fiber	24
11	Development & demonstration of high-efficiency Yb1200 80/400 DC-PM fibers (or similar fiber design)	27

12 P≥3kW operation (<100kHz linewidth, M²≤1.4, PER≥20 dB), efficiency≥30% 33 runtime~200sec, lifetime>100hrs (extrapolated from accum. runtime)

2.2 Phase 1 Tasks

Fibertek, Inc.

- (1) Detailed design modeling and assessment of fiber-MOPA system and its key components (optical fiber, LD pumps, pump combiner, etc.) in support of Phase I milestone. Alternate design points will be specifically obtained. This task is an extension of the methodology described in this proposal. Interdependent parameters will be specifically included.
- (2) Design, modeling and separate experimental verification of MOPA thermal management system in support of an optimized scheme for thermal-gradient induced SBS mitigation.
- (3) Initial assessment and verification of individual components for cw operation to respective power levels estimated for the final power amplifier stage of the MOPA system, e.g. optical fiber ends, LD pumps, Pump combiners, Isolators, etc.
- (4) Baseline fiber-MOPA system set-up using currently available optimized fiber based on same optical fiber fabrication (DND) process (*i.e.* based on using commercially available Liekki Yb1200-30/250μm 0.07NA-DC-PM). Improved & quantitative PM-fiber splicing method will be used, based on actively-controlled PM fusion splicing from AFL/Fujikura.
- (5) Assemble and test a 'free-space' connected version of the final stage of MOPA design point, to assess performance against the predicted/estimated parameters, as well as Phase I milestone. Revise design points and optimize aspects of above steps (as needed) to optimize measured performance against Phase I milestone
- (6) Assemble and test an "all-fiber" version of the final design point for kW class MOPA system, producing a highly coherent output per the Phase I milestone. Make it available for on-site test evaluation by an external review panel.
- (7) Program management, interaction and supply of partners/subcontractors for key component development tasks. Communicate technical, program & financial status to DARPA.

- (8) Supply to Fibertek, non-PM polymer-clad version of Yb1200-(45/45)/375µm-0.07NA-DC fiber (this is based on existing Liekki design for advanced (non-commercial) fibers)
- (9) Supply to Fibertek, non-PM polymer-clad version of Yb1200-(60/60)/500μm-0.07NA-DC fiber (this is based on existing Liekki design for advanced (non-commercial) fibers)
- (10) Based on COTS design, deliver Yb1200-25/230/250 DC-PM 'glass-clad' fiber, to evaluate advantages of glass-clad fiber for pump-coupling and thermal management
- (11) Develop & fabricate non-PM glass-clad gain-tailored LMA fibers with 60 & 80um core
- (12) Develop & fabricate index-tailored fibers for improved beam-quality of LMA 80um fiber
- (13) Develop & fabricate step-doped approach to acoustic-profile tailored LMA fiber, for added SBS mitigation.
- (14) this number is no longer used
- (15) this number is no longer used

(16) Assemble, test & supply to Fibertek, Qty = 2 of 200W, 200 μ m 0.22NA fiber-coupled 976nm high-power LD pumps. Extend to prototype a 400W, 400 μ m, 0.22NA, pump.

- (17) Optimize laser-bar design & assembly and extend architecture of beam-combining to demonstrate prototype of 600W/200μm/0.22NA, fiber-coupled 976nm LD pumps
- (18) Assemble, test and deliver to Fibertek, Qty=3 of 600W, 200μm 0.22NA, fiber-coupled 976 nm high-power LD pumps

Others

- (19) OFR, Inc.: high-power isolators up to 30W and beyond, with fiber-pigtails
- (20) EM4, Inc.: fiber-pigtail and innovative fiber-end preparation for high cw powers, and 'compensated' high-power isolator designs
- (21) Work with nLight Corp. (sub-contracted) to develop and demonstrate alternate approach to (single-emitter LD chips based) compact high-brightness fiber-coupled pumps

2.3 Phase 2 Tasks

Fibertek, Inc.

- (22) Review and re-assess design path to be selected for Phase II milestone demonstration.
- (23) Optimize and implement fiber thermal management scheme for "80/400µm" fiber
- (24) Assessment and verification of individual components for cw operation to respective power levels estimated for the final power amplifier stage of the MOPA system, *e.g.* optical fiber ends, LD pumps, Pump combiners, Isolators, *etc*.
- (25) Revised multi-stage MOPA system (an additional YDFA-amplifer stage is needed so as to be capable of producing high-enough signal power input (≥30W), so as to limit gain to ≤20dB for the final power amplification stage to achieve ≥ 3 kW coherent power output
- (26) Assemble & test free-space coupled version of final power amplifier stage
- (27) Assemble and test an "all-fiber" version of the final design point for kW class MOPA system, producing a highly coherent output per the Phase II milestone. Make it available for on-site test evaluation by an external review panel.
- (28) Program management, interaction and supply of partners/subcontractors for key component development tasks. Communicate technical & program status to DARPA.

- (29) Develop & fabricate non-PM all-glass-clad Yb1200-80/400/460μm-0.07NA-DC fiber
- (30) Develop & fabricate modified RI-index & Yb-doping profile, for fiber from task 29
- (31) Develop & fabricate PM version of fiber from task 30
- (32) Process optimization for higher dopings (i.e. Yb2000), with low photo-darkening
- (33) Other custom fiber per evolving program requirements (e.g. 100μm core, SBS mitigation via acoustic anti-guiding)

- (34) Assemble/Test/Deliver Qty=6 of previously developed 600W/200μm,0.22NA pumps
- (35) Multi-kW (>2kW), 400μm,0.22NA fiber-coupled 976nm pumps (i) design & process development, (ii) prototype build & test
- (36) Assemble/Test and deliver 2 more above pump units from task 35

<u>Others</u>

- (37) Avensys/ITF Labs: Improved prototypes (Qty=2) of their kW pump combiners for ≥ 2 kW, with $80/400/460\mu m$,0.22NA output fiber
- (38) EM4, Inc. OR OFR, Inc.: select preferred supplier to continue work on fiber-pigtailed (isolator + integrated filters) to > 50 W cw power handling capability
- (39) nLight: continued work on alternate approach to compact high-brightness 976 nm fiber-coupled pump 'demonstrator' unit
- (40) Program Closure Fibertek, Inc.

3.0 Program Management

Fibertek, Inc. shall provide oversight of all development activities, including those to be performed by subcontractor and/or outside vendors, to ensure cost and schedule compliance in accordance with the basic contract. Fibertek, Inc. shall be prepared to support a kickoff meeting at the contractor's facility and support periodic reporting and offsite program reviews, including the final reports.

Fibertek, Inc. shall support/host up to two (2) weeks of on-site performance testing by a Government team at the end of both Phase I and Phase II.

Fibertek, Inc. shall allow Government representatives to witness any contractorperformed tests that will be carried out, as scheduled, in order to validate performance consistent with the metrics delineated in this SOW. Fibertek, Inc. shall coordinate such test activities with the Contracting Officer's Representative (COR) to allow the Government the opportunity to witness such tests on-site as they are being conducted.

4.0 Program (Phase I and II) Deliverables

	Deliverables		Yea	ır 1			Yea	ar 2			Yea	ar 3	
	Deliverables	1	2	3	4	1	2	3	4	1	2	3	4
1	Design + Test results on all prior stages		Х										
2	Design + Test result on 30/250 hp-MOPA		Х										
3	Design + Test result on 50/250 hp-MOPA					Х							
4	Thermal management design & test (via FBG)				X								
5	600W fiber-coupled(200u/0.22NA) LD pump					X							
6	Fiber-optic Isolator + ASE-filter (10,30,50W)				X		X		X				
7	Milestone 1 : RIFL Phase-I demo						Х						
8	Design & Test demo of 80/400 f-MOPA								X				
9	Design & Test of glass-clad 80/400 f-MOPA									Х			
10	Multi-kW fiber-coupled pump in 400u fiber	l								X			
11	Milestone 2: RIFL Phase-II demo										Х		
	<u>Reports</u>												
a	Technical Summary Report	Х	Х	Х	Х	X	X	X	X	X	X		
b	Cost Summary Report	Х	X	Х	Х	Χ	Х	X	Х	Х	X		100
С	Progress Report (X) & Program Report (X)				Х		Х		Х			Х	

Note: (1)All deliverables in last week of indicated quarter from start of program (2)hp-MOPA=high-power MOPA Note (2) Phase I and II Final Reports, interim technical reports, and interim cost reports shall be provided as required by Sections C and F of the contract.

	TO A TOWN CONTRACTOR	TICA TOTAL OF CONTRA CON	1. CONTRACTID CO	ODE PAGE OF PAGES
AMENDMENT OF SOLIC	TATION/MODI	FICATION OF CONTRACT	U	1 3
2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. P	ROJECTNO.(Ifapplicable)
P00003	17-Nov-2009	SEE SCHEDULE		
6. ISSUED BY CODE	HR0011	7. ADMINISTERED BY (Ifother than item 6)	CODE	S2404A
DARPA CMO ATTN: MICHAEL D. BLACKSTONE		DCMA VIRGINIA 10500 BATTLEVIEW PARKWAY SUITE 200 MANASSAS VA 20109-2342		
3701 N, FAIRFAX DR. ARLINGTON VA 22203-1714		WALLEST AND		
8. NAME AND ADDRESS OF CONTRACT (FIBERTEK, INC. 510 HERNDON PKW	OR (No., Street, County	State and Zip Code)	9A. AMENDMENT 9B. DATED (SEE I	OF SOLICITATION NO. TEM 11)
HERNDON VA 20170-5225			ì	NTRACT/ORDER NO.
			10B. DATED (SEE	
CODE 8Y519	FACILITY CC		102 00. 2000	
		APPLIES TO AMENDMENTS OF SOLICI		
The above numbered solicitation is amended as se	t forth in Item 14. The hour an	d date specified for receipt of Offer	is extended, i	s not extended.
RECEIVED AT THE PLACE DESIGNATED FOR REJECTION OF YOUR OFFER. If by virtue of the second seco	OR THE RECEIPT OF OFFER nis amendment you desire to do the solicitation and this ame	n and amendment numbers. FAILURE OF YOUR AC S PRIOR TO THE HOUR AND DATE SPECIFIED I hange an offer already submitted, such change may be ndment, and is received prior to the opening hour and	MAY RESULT IN made by telegram or letter,	SE
See Schedule	N DATA (II Tequireu)			
		TO MODIFICATIONS OF CONTRACTS		
	JRSUANT TO: (Specify	ACT/ORDER NO. AS DESCRIBED IN ITEM authority) THE CHANGES SET FORTH I		DE IN THE
B. THE ABOVE NUMBERED CONTRAG office, appropriation date, etc.) SET F	ORTH IN ITEM 14, PU	D TO REFLECT THE ADMINISTRATIVE RSUANT TO THE AUTHORITY OF FAR PURSUANT TO AUTHORITY OF:	E CHANGES (such as c 43.103(B).	hanges in paying
X D. OTHER (Specify type of modification Unilateral: IAW FAR 52.232-22 "Limitatic				
E. IMPORTANT: Contractor X is not		sign this document and return	copies to the issuing of	ffice.
14. DESCRIPTION OF AMENDMENT/MO where feasible.) Modification Control Number: myess	iH10118	ed by UCF section headings, including solicituding solicituding in the amount of \$297,000 (AO#X6)		
Except as provided herein, all terms and conditions of 15A. NAME AND TITLE OF SIGNER (Type 15B. CONTRACTOR/OFFEROR		16A. NAME AND TITLE OF COMMICHAEL D. BLACKSTONE / PCO TEL: (571) 218-4804	NTRACTING OFFICE	R (Type or print)
		BY		17-Nov-2009
(Signature of person authorized to sign))	(Signature of Contracting Off		DARD FORM (20 (B. 10)

SUMMARY OF CHANGES

The following has been modified as indicated below:

SECTION B - SUPPLIES OR SERVICES AND PRICES

SUBCLIN 000103 is added as follows:

ITEM NO

000103

Funding for CLIN 0001 only

AMOUNT

\$0.00

AO No. X670/19

ACRN AC

\$297,000.00

SECTION G - CONTRACT ADMINISTRATION DATA

Accounting and Appropriation

Summary for the Payment Office

As a result of this modification, the total funded amount for this document was increased by \$297,000.00 from \$3,152,000.00 to \$3,449,000.00.

SUBCLIN 000103:

Funding on SUBCLIN 000103 is initiated as follows:

ACRN: AC

Acctng Data: 9700400 1320 X670 P0G10 2525 DPAC 0 5009 S12136 62702E

Increase: \$297,000.00

Total: \$297,000.00

G-6 Incremental Funding

The following has been modified as bolded below:

(a) This contract shall be subject to incremental funding, as indicated in the table below, which is presently made available for performance under this contract. It is estimated that the funds presently available are sufficient to permit the Contractor's performance through the performance end dates indicated in the table below. Except in accordance with the Section I clause FAR 52.232-22, "Limitation of Funds," no legal liability of the part of the Government for payment of any money in excess of the funds listed in the table

below shall arise unless and until additional funds are made available by the Contracting Officer through a modification to this contract.

Phase	CLIN 0001	Funding Provided to Date \$3,449,000	Funding Period of Performance End Date 28 February 2010
2	0002	TBD	TBD

(end of clause)

3. Except as modified herein, all terms and conditions of Contract No. HR0011-09-C-0028 shall remain unchanged and in full force and effect.

AMENDMENT OF SOLICITA	TION/MODIF	ICATION OF CONTRACT	1. CONTRACT	ID CODE	PAGE OF PAGES
AMENDMENT OF SOLICITA		ication of contract	U		1 2
2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.		5. PROJECT	NO.(Ifapplicable)
P00004	08-Feb-2010	SEE SCHEDULE			
6. ISSUED BY CODE	HR0011	7. ADMINISTERED BY (Ifother than item 6)	CO	DE \$2404	1A
DARPA		DCMA VIRGINIA 10500 BATTLEVIEWPARKWAY			
CMO ATTN: MICHAEL D. BLACKSTONE		SUITE 200 MANASSAS VA 20109-2342			
3701 N. FAIRFAX DR. ARLINGTON VA 22203-1714		11,11,100,00 (1,120,100,120,120,120,120,120,120,120,12			
			To a summing	CENTE OF OO	LICITATIONING
NAME AND ADDRESS OF CONTRACT OR (FIBERTEK, INC.	No., Street, County,	State and Zip Code)	9A. AMENDM	ENT OF SO	LICITATION NO.
510 HERNDON PKWY HERNDON VA 20170-5225			9B. DATED (S	EE ITEM 1	1)
HERMOON VA 20170-0223		_			
		>	10A, MOD, OF HR0011-09-C-	? CONTRAC -0028	T/ORDER NO.
			10B. DATED		13)
CODE 8Y519	FACILITY COI	DE >	1		
11.	THIS ITEM ONLY A	PPLIES TO AMENDMENTS OF SOLICE	TATIONS		
The above numbered solicitation is amended as set forth	in Item 14. The hour and	date specified for receipt of Offer	is extended,	is not exter	nded.
Offer must acknowledge receipt of this amendment prio	r to the hour and date spec	cified in the solicitation or as amended by one of the	following methods:		
(a) By completing Items 8 and 15, and returning	_ ·	nt; (b) By acknowledging receipt of this amendment			
or (c) By separate letter or telegram which includes a re RECEIVED AT THE PLACE DESIGNATED FOR TH				. IO BE	
REJECTION OF YOUR OFFER. Ifby virtue of this am	•	•		etter,	
provided each telegram or letter makes reference to the		dment, and is received prior to the opening hour and	d date specified.		
12. ACCOUNTING AND APPROPRIATION DA	ATA (If required)				
12 THEFFE	M ADDI IECONI V	TO MODIFICATIONS OF CONTRACTS/	OPPER		· · · · · · · · · · · · · · · · · · ·
		CT/ORDER NO. AS DESCRIBED IN ITE			
A. THIS CHANGE ORDER IS ISSUED PURSU CONTRACT ORDER NO. IN ITEM 10A.	JANT TO: (Specify a	authority) THE CHANGES SET FORTH I	N ITEM 14 ARE	MADE IN T	HE
D. THE ADOLE NUMBERED CONTRACTOR	DDED IGNODIEIE	TO PER POT THE ADMINISTRATION	CHANCES (1		
B. THE ABOVE NUMBERED CONTRACT/C office, appropriation date, etc.) SET FORT				i as changes i	n paying
X C. THIS SUPPLEMENT AL AGREEMENT IS Mutual Agreement of the parties	ENTERED INTO P	URSUANT TO AUTHORITY OF:			
D. OTHER (Specify type of modification and	authority)				
E. IMPORTANT: Contractor is not,	x is required to si	gn this document and return 1	copies to the issui	ng office.	
14. DESCRIPTION OF AMENDMENT/MODIFICATION (MATERIAL PROPERTY)		d by UCF section headings, including solicit	tation/contract sul	bject matter	
Modification Control Number: mvessill103 The purpose of this modification is to extend t		performance, at no additional cost to the	Government from	m 2 Anril 20°	10 to
30 April 2010. See page tw o (2).	no , nace i perior ex	,			,
Except as provided herein, all terms and conditions of the d	ocument referenced in Iter	n 9A or 10A, as heretofore changed, remains unchan	ged and in full force a	nd effect.	
15A. NAME AND TITLE OF SIGNER (Type or		16A. NAME AND TITLE OF CO			or print)
MICHAEL D. B		MICHAEL D. BLACKSTONE / PCO	co ,		
ISD CONTRACTOR/OPEROR	ILSO DATE CON	TEL: (571) 218-4804	EMAIL: michael.		a.mil 5C. DATE SIGNED
15B. CONTRACT OR/OFFEROR	15C. DATE SIGNI	ED 16B UNITED STATES OF AMER			08-Feb-2010
(Signature of person authorized to sign)	-	(Signature of Contracting Off	ïcer)		00-1 60-2010

SUMMARY OF CHANGES

The following has been modified as indicated below:

1. SECTION F - DELIVERIES OR PERFORMANCE

F-1 Term of Contract

The following have been modified:

- (a) The term of the contract commences 03 October 2008 and continues through 30 April 2010.
- (b) The period of performance for Option 1, as set forth in CLIN 0002, shall be from the effective date of the option exercise to and including 15 months thereafter. (end of clause)

F-2 Reports and Other Deliverables

(a) Delivery of all reports and other deliverables shall be made to the addressee specified in F-3 entitled "Report Distribution" in accordance with the following:

Item No.	Description	Due Date (on or before)
0001,0002	R&D Status Reports	Monthly IAW Section C-2
0001,0002	Interim R&D Technical Reports	Quarterly IAW Section C-2
0001,0002	RIFL Final Report	19 months after date of contract award (30 April 2010)
		If option is exercised, 34 months after date of contract award (30 July 2011)
0001,0002 (end of clause)	Additional Misc. Deliverables	As required IAW Section C-2

2. Except as modified herein, all terms and conditions of contract HR0011-09-C-0028 shall remain unchanged and in full force and effect.

AMENDMENT OF SOLICITATIO	NI/MODERIC A TO	ION OF CONTRACT	1. CONTRACT	ID CODE	PAGE OF PAGE
AMENDMENT OF SOLICITATIO	NAVIODIFICALI	ION OF CONTRACT	U		1 2
. AMENDMENT/MODIFICATION NO. 3. EFFECTIVE DATE 4. REQUISITION/PURCHASE REQ. NO.			5. PROJECT NO		
P00004	2/8/2010	SEE SCHEDULE			
DARPA CMO ATTN: MICHAEL D. BLACKSTONE 3701 N. FAIRFAX DR. ARLINGTON VA 22203-1714	HR0011	7. ADMINISTERED BY (If other than item 6) DCMA VIRGINIA 10500 BATTLEVIEW PARKWAY SUITE 200 MANASSAS VA 20109-2342	со	DE S240	4A
8. NAME AND ADDRESS OF CONTRACTOR (FIBERTEK, INC. 510 HERNDON PKWY HERNDON VA 20170-5225	(No., Street, County, St	tate and Zip Code)	9B. DATED (SI	CONTRAC -0028	T/ORDER NO.
CODE 8Y519	FACILITY COI	Ri	02-Oct-2008		
The above numbered solicitation is amended as set fo		JES TO AMENDMENTS OF SOLICITATI	ONS	is not exte	
A. THIS CHANGE ORDER IS ISSUED PURS CONTRACT ORDER NO. IN ITEM 10A. B. THE ABOVE NUMBERED CONTRACT/O	he solicitation and this am TA (If required) APPLIES ONLY TO M S THE CONTRACT/C UANT TO: (Specify a	condiment, and is received prior to the opening hour ODIFICATIONS OF CONTRACTS/ORDE DRDER NO. AS DESCRIBED IN ITEM 14. authority) THE CHANGES SET FORTH IN	RS. ITEM 14 ARE MA	DE IN THE	
X C. THIS SUPPLEMENTAL AGREEMENT IS Mutual Agreement of the parties		TV-CALL TO THE TV-CALL TO TV-CALL TO TW-CALL TW	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	The state of the s	
D. OTHER (Specify type of modification and a	uthority)				
E. IMPORTANT: Contractor is not, 14. DESCRIPTION OF AMENDMENT/MODIFICATION of the second sec	in the second	400	copies to the issuin		
Modification Control Number: mvessill10 The purpose of this modification is to extend 30 April 2010. See page two (2).		of performance, at no additional cost to th	e Government, fr	om 2 April 2	2010 to
Except as provided herein, all terms and conditions of the 15A. NAME AND TITLE OF SIGNER (Type or Tisca Devsey Con		16A. NAME AND TITLE OF CON	TRACTING OFFICING Officer	CER (Type o	r print) ne@darpa.mil
Signature of person authorized to sign)	15C. DATE SIGNI 2/5/1				6C. DATE SIGNE

APPROVED BY OIRM 11-84

30-105-04

STANDARD FORM 30 (Rev. 10-83) Prescribed by GSA FAR (48 CFR) 53.243

SUMMARY OF CHANGES

The following has been modified as indicated below:

1. SECTION F - DELIVERIES OR PERFORMANCE

F-1 Term of Contract

The following have been modified:

- (a) The term of the contract commences 03 October 2008 and continues through 30 April 2010.
- (b) The period of performance for Option 1, as set forth in CLIN 0002, shall be from the effective date of the option exercise to and including 15 months thereafter. (end of clause)

F-2 Reports and Other Deliverables

(a) Delivery of all reports and other deliverables shall be made to the addressee specified in F-3 entitled "Report Distribution" in accordance with the following:

Item No.	Description	Due Date (on or before)
0001,0002	R&D Status Reports	Monthly IAW Section C-2
0001,0002	Interim R&D Technical Reports	Quarterly IAW Section C-2
0001,0002	RIFL Final Report	19 months after date of contract award (30 April 2010)
		If option is exercised, 34 months after date of contract award (30 July 2011)
0001,0002 (end of clause)	Additional Misc. Deliverables	As required IAW Section C-2

2. Except as modified herein, all terms and conditions of contract HR0011-09-C-0028 shall remain unchanged and in full force and effect.

AMENDMENT OF SOLICITA	TIONMODU	FICATION OF CONTRACT	1. CONTRACT	ID CODE	PAGE OF PAGES
AMENDMENT OF SOLICITA	ATTOM/MODII	FICATION OF CONTRACT	U		1 2
2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.		5. PROJEC	TNO.(Ifapplicable)
P00005	11-Mar-2010	SEE SCHEDULE			
6. ISSUED BY CODE	HR0011	7. ADMINISTERED BY (Ifother than item 6)	CC	DE S24	04A
DARPA CMO ATTN: MICHAEL D. BLACKSTONE MICHAEL BLACKSTONE@DARPA MIL 3701 N. FAIRFAX DRIVE ARLINGTON VA 22203-1714		DCMA VIRGINIA 10500 BATTLEVIEW PARKWAY SUITE 200 MANASSAS VA 20109-2342			
8. NAME AND ADDRESS OF CONTRACTOR	(No Street County	State and 7 in Code)	9A. AMENDM	MENT OF S	OLICITATION NO.
FIBERTEK, INC. 510 HERNDON PKWY HERNDON VA 20170-5225	(107, broot, county,	and and any code)	9B. DATED (S		
					CT/ORDER NO.
CODE 8Y519	EACH IEN CO	DE	10B. DATED 02-Oct-2008	(SEE II Er	VI 13)
	FACILITY CO	APPLIES TO AMENDMENTS OF SOLIC	102 001 2000		
The above numbered solicitation is amended as set fort			is extended:	is not ex	4
(a) By completing Items 8 and 15, and returning or (c) By separate letter or telegram which includes a r RECEIVED AT THE PLACE DESIGNATED FOR TI REJECTION OF YOUR OFFER. Ifby virtue of this as provided each telegram or letter makes reference to the 12. ACCOUNTING AND APPROPRIATION D.	eference to the solicitation HE RECEIPT OF OFFERS mendment you desire to che solicitation and this ame	S PRIOR TO THE HOUR AND DATE SPECIFIED nange an offer already submitted, such change may be	CKNOWLEDGMEN' MAY RESULT IN made by telegram or l	тто ве	,
See Schedule					
		TO MODIFICATIONS OF CONTRACTS			
A. THIS CHANGE ORDER IS ISSUED PURS CONTRACT ORDER NO. IN ITEM 10A.		ACT/ORDER NO. AS DESCRIBED IN ITE authority) THE CHANGES SET FORTH I		MADE IN	ТНЕ
	TH IN ITEM 14, PU	RSUANT TO THE AUTHORITY OF FAF		n as change	s in paying
C. THIS SUPPLEMENT AL AGREEMENT IS	SENTERED INTO P	URSUANT TO AUTHORITY OF:			
X D. OTHER (Specify type of modification and Unilateral IAW 52.232-22	authority)				
E. IMPORTANT: Contractor X is not,	is required to s	ign this document and return	copies to the issui	ng office.	
14. DESCRIPTION OF AMENDMENT/MODIF where feasible.) Modification Control Number: mvessill10 The purpose of this modification is to apply in This action fully funds Phase I. See page two	467 cremental funding in				
Except as provided herein, all terms and conditions of the 15A. NAME AND TITLE OF SIGNER (Type of		16A. NAME AND TITLE OF CO. MICHAELD. BLACKSTONE / PCO	NTRACTING OF	FICER (Ty	
15D CONTRACTOR/OFFEROR	ISC DATE OF	TEL: (571) 218-4804	EMAIL: michael	.prackstone@da	·
15B. CONTRACT OR/OFFEROR	15C. DATE SIGN	BY (D)(G)			16C. DATE SIGNED 11-Mar-2010
(Signature of person authorized to sign)		(Signature of Contracting Of	icer)		

SUMMARY OF CHANGES

The following has been modified as indicated below:

SECTION G - CONTRACT ADMINISTRATION DATA

Accounting and Appropriation

Summary for the Payment Office

As a result of this modification, the total funded amount for this document was increased by \$81,165.00 from \$3,449,000.00 to \$3,530,165.00.

SUBCLIN 000103:

G-6 Incremental Funding

The following has been modified as bolded below:

(a) This contract shall be subject to incremental funding, as indicated in the table below, which is presently made available for performance under this contract. It is estimated that the funds presently available are sufficient to permit the Contractor's performance through the performance end dates indicated in the table below. Except in accordance with the Section I clause FAR 52.232-22, "Limitation of Funds," no legal liability of the part of the Government for payment of any money in excess of the funds listed in the table below shall arise unless and until additional funds are made available by the Contracting Officer through a modification to this contract.

Phase	<u>CLIN</u> 0001	Funding Provided to Date \$3,530,165	Funding Period of Performance End Date 30 April 2010
2	0002	TBD	TBD

(end of clause)

2. Except as modified herein, all terms and conditions of HR0011-09-C-0028 shall remain unchanged and in full force and effect.

A RATE NIDA ATENIA OF COLUMN	ATTONIAGONI	DECAMBON OF CONTROL CON	1. CONTRACT ID CODE	PAGE OF PAGES
AMENDMENT OF SOLICIT	A HUN/MODII	FICATION OF CONTRACT	U	1 3
2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJE	CT NO.(Ifapplicable)
P00006	30-Apr-2010	SEE SCHEDULE		
6. ISSUED BY CODE DARPA CMO ATTN: MICHAEL D. BLACKSTONE 3701 N. FAIRFAX DR. ARLINGTON VA 22203-1714	HR0011	7. ADMINISTERED BY (Ifother than item 6) DCMA VIRGINIA 10500 BATTLEVIEW PARKWAY SUITE 200 MANASSAS VA 20109-2342	CODE S2	404A
8. NAME AND ADDRESS OF CONTRACT OR	(No Street County	State and Zip Code)	9A. AMENDMENT OF	SOLICITATION NO.
FIBERTEK, INC. 510 HERNDON PKWY HERNDON VA 20170-5225	(110., 511001, 20411),	State and Exp Code)	9B. DATED (SEE ITEM	111)
			X 10A. MOD. OF CONTR HR0011-09-C-0028	ACT/ORDER NO.
			10B. DATED (SEE ITE	M 13)
CODE 8Y519	FACILITY CO		X 02-Oct-2008	
The above numbered solicitation is amended as set for		APPLIES TO AMENDMENTS OF SOLI		extended.
(a) By completing Items 8 and 15, and returning or (c) By separate letter or telegram which includes a RECEIVED AT THE PLACE DESIGNATED FOR REJECTION OF YOUR OFFER. Ifby virtue of this provided each telegram or letter makes reference to the 12. ACCOUNTING AND APPROPRIATION I	reference to the solicitation THE RECEIPT OF OFFER Amendment you desire to cle e solicitation and this ame	S PRIOR TO THE HOUR AND DATE SPECIFIED nange an offer already submitted, such change may	ACKNOWLEDGMENT TO BE D MAY RESULT IN be made by telegram or letter,	
		TO MODIFICATIONS OF CONTRACT ACT/ORDER NO. AS DESCRIBED IN IT		
A. THIS CHANGE ORDER IS ISSUED PUR CONTRACT ORDER NO. IN ITEM 10A	SUANT TO: (Specify			THE .
B. THE ABOVE NUMBERED CONTRACT office, appropriation date, etc.) SET FOR				es in paying
X C. THIS SUPPLEMENT AL AGREEMENT Mutual Agreement of the parties	IS ENTERED INTO F	PURSUANT TO AUTHORITY OF:		
D. OTHER (Specify type of modification an	d authority)			
E. IMPORTANT: Contractor is not,	x is required to s	ign this document and return 1	copies to the issuing office.	
14. DESCRIPTION OF AMENDMENT/MODI where feasible.) Modification Control Number: mvessill1 The purpose of this modification is to extend Government. See page two (2).	0652		•	er
Except as provided herein, all terms and conditions of the 15A. NAME AND TITLE OF SIGNER (Type		an 9A or 10A, as heretofore changed, remains unch 16A. NAME AND TITLE OF CO MICHAEL D. BLACKSTONE / PCO		ype or print)
		TEL: (571) 218-4804	EMAIL: michael.blackstone@	darpa.mil
15B. CONTRACT OR/OFFEROR	15C. DATE SIGN	IED 16B UNITED STATES OF AME	ERICA	16C. DATE SIGNED
(Signature of person authorized to sign)	-	(Signature of Contracting C	Officer)	30-Apr-2010

SUMMARY OF CHANGES

The following has been modified as indicated below:

1. SECTION F - DELIVERIES OR PERFORMANCE

F-1 Term of Contract

The following have been modified as bolded below:

- (a) The term of the contract commences 03 October 2008 and continues through 31 May 2010.
- (b) The period of performance for Option 1, as set forth in CLIN 0002, shall be from the effective date of the option exercise to and including 15 months thereafter.
 (end of clause)

F-2 Reports and Other Deliverables

(a) Delivery of all reports and other deliverables shall be made to the addressee specified in F-3 entitled "Report Distribution" in accordance with the following:

Item No.	Description	Due Date (on or before)
0001,0002 0001,0002	R&D Status Reports Interim R&D Technical Reports	Monthly IAW Section C-2 Quarterly IAW Section C-2
0001,0002	RIFL Final Report	20 months after date of contract award (31 May 2010)
		If option is exercised, 35 months after date of contract award (31 August 2011)
0001,0002 (end of clause)	Additional Misc. Deliverables	As required IAW Section C-2

2. SECTION G - CONTRACT ADMINISTRATION DATA

G-6 Incremental Funding

The following have been modified as bolded below:

(a) This contract shall be subject to incremental funding, as indicated in the table below, which is presently made available for performance under this contract. It is estimated that the funds presently available are sufficient to permit the Contractor's performance through the performance end dates indicated in the table below. Except in accordance with the Section I clause FAR 52.232-22, "Limitation of Funds," no legal liability of the part of the Government for payment of any money in excess of the funds listed in the table below shall arise unless and until additional funds are made available by the Contracting Officer through a modification to this contract.

Phase	CLIN	Funding Provided to Date	Funding Period of Performance End Date 31 May 2010
1	0001	\$3,530,165	
2	0002	TBD	TBD

(end of clause)

3. Except as modified herein, all terms and conditions of HR0011-09-C-0028 shall remain unchanged and in full force and effect.