

**AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT**

1. Contract ID Code  
Cost Plus Fixed Fee

Page 1 Of 19

2. Amendment/Modification No. P00011	3. Effective Date 2013SEP30	4. Requisition/Purchase Req No. SEE SCHEDULE	5. Project No. (If applicable)
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6. Issued By U.S. ARMY CONTRACTING COMMAND PATRICK RUOFF WARREN, MICHIGAN 48397-5000 HTTP://CONTRACTING.TACOM.ARMY.MIL  EMAIL: PATRICK.RUOFF@US.ARMY.MIL	Code W56HZV	7. Administered By (If other than Item 6) DCMA LATHROP P O BOX 232 700 EAST ROTH ROAD, BLDG 330 (LATHROP, CA) FRENCH CAMP CA 95231-0232	Code S0507A
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8. Name And Address Of Contractor (No., Street, City, County, State and Zip Code)  ALTEX TECHNOLOGIES CORPORATION 244 SOBRANTE WAY SUNNYVALE, CA 94086-4807	<input type="checkbox"/>	9A. Amendment Of Solicitation No.
	<input type="checkbox"/>	9B. Dated (See Item 11)
	<input checked="" type="checkbox"/>	10A. Modification Of Contract/Order No. W56HZV-10-C-0348
	<input type="checkbox"/>	10B. Dated (See Item 13) 2010AUG20
Code 1FEH3	Facility Code	

**11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS**

The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offers

is extended,  is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing items 8 and 15, and returning \_\_\_\_\_ copies of the amendments; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. **FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER.** If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

**12. Accounting And Appropriation Data (If required)**

SEE SECTION G (IF APPLICABLE)

**13. THIS ITEM ONLY APPLIES TO MODIFICATIONS OF CONTRACTS/ORDERS  
It Modifies The Contract/Order No. As Described In Item 14.**

<input type="checkbox"/>	A. This Change Order is Issued Pursuant To: The Contract/Order No. In Item 10A.	The Changes Set Forth In Item 14 Are Made In
<input type="checkbox"/>	B. The Above Numbered Contract/Order Is Modified To Reflect The Administrative Changes (such as changes in paying office, appropriation data, etc.) Set Forth In Item 14, Pursuant To The Authority of FAR 43.103(b).	
<input checked="" type="checkbox"/>	C. This Supplemental Agreement Is Entered Into Pursuant To Authority Of:	Mutual Agreement
<input type="checkbox"/>	D. Other (Specify type of modification and authority)	

**E. IMPORTANT:** Contractor  is not,  is required to sign this document and return \_\_\_\_\_ copies to the Issuing Office.

**14. Description Of Amendment/Modification (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)**

SEE SECOND PAGE FOR DESCRIPTION

Except as provided herein, all terms and conditions of the document referenced in item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. Name And Title Of Signer (Type or print)		16A. Name And Title Of Contracting Officer (Type or print) LYNN M. BYRNE LYNN.M.BYRNE@US.ARMY.MIL (586)282-6553	
15B. Contractor/Offeror  (Signature of person authorized to sign)	15C. Date Signed	16B. United States Of America By _____ /SIGNED/ (Signature of Contracting Officer)	16C. Date Signed 2013SEP30

**CONTINUATION SHEET****Reference No. of Document Being Continued**

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PIIN/SIIN W56HZV-10-C-0348

MOD/AMD P00011

**Name of Offeror or Contractor:** ALTEX TECHNOLOGIES CORPORATION

## SECTION A - SUPPLEMENTAL INFORMATION

Buyer Name: PATRICK RUOFF  
Buyer Office Symbol/Telephone Number: CCTA-HCB-C/(586)282-6545  
Type of Contract: Cost Plus Fixed Fee  
Kind of Contract: Research and Development Contracts  
Type of Business: Other Small Business Performing in U.S.  
Surveillance Criticality Designator: C  
Weapon System: No Identified Army Weapons Systems  
Contract Expiration Date: 2013SEP30

\*\*\* End of Narrative A0000 \*\*\*

PROGRAM: JP8 Fuel Cell Auxiliary Power Unit (APU) System

PURPOSE OF MODIFICATION: Add funding and extend the period of performance for Base effort and Option Periods.

Previous Negotiated Value: \$5,525,430.00  
This Action: \$ 469,829.00  
Current Negotiated Amount: \$5,995,259.00

Previous Obligated Amount: \$5,525,430.00  
This Action: \$ 469,829.00  
Current Obligated Amount: \$5,995,259.00

1. This modification P00011 to contract W56HZV-10-C-0348 is a bilateral supplemental agreement.

2. The purpose of this modification is to:

- a. Add additional funding in the amount of \$469,829.
- b. Revise the statement of work and extend the period of performance for the base effort to 30 April 2014.

3. As a result of this modification, the contract is revised as follows:

a. Section B:

i. CLIN 0001 is increased by \$469,829 in estimated cost. There is no additional fee associated with this modification. The performance completion date is extended from 20 November 2013 to 30 April 2014.

ii. Sub-CLINs 000107 through 000110 are established and funded as follows:

Sub-CLIN 000107: \$ 65,992 (PRON: R32MC126R3, ACRN: AG)  
Sub-CLIN 000108: \$ 8,886 (PRON: R32MC127R3, ACRN: AH)  
Sub-CLIN 000109: \$288,792 (PRON: R33MC124R3, ACRN: AK)  
Sub-CLIN 000110: \$106,159 (PRON: R33MC125R3, ACRN: AJ)

iii. Sections B.2.2 FUNDING SCHEDULE and B.2.3 FUNDS ALLOTTED are updated to reflect the increase in funding of \$469,829.

b. Section C:

i. Paragraph C.2.1.8.2 is revised as follows:

FROM: The contractor shall deliver the 1000 hour test plan to the COR within 30 months after award in accordance with CDRL A002.

TO: The contractor shall deliver the 1000 hour test plan to the COR NLT 15 April 2014 in accordance with CDRL A002.

ii. C.2.1.8.3 is revised as follows:

FROM: After receipt of COR approval, the contractor shall conduct a demonstration of the fully integrated JP8 Fuel cell APU System and test the system as their facility pursuant to the approved test plan. The Government reserves the right to measure the metrics contained in Exhibit C during the 1000 hour testing conducted at the contractors facility; however, these are not metrics that have any requirements for the base effort. Results shall be provided in the Final Technical Report for the base effort described in C.3.3.

<b>CONTINUATION SHEET</b>	<b>Reference No. of Document Being Continued</b>	<b>Page 3 of 19</b>
	PIIN/SIIN W56HZV-10-C-0348	MOD/AMD P00011
<b>Name of Offeror or Contractor:</b> ALTEX TECHNOLOGIES CORPORATION		

TO: The contractor shall deliver the fully integrated JP8 Fuel cell APU System to TARDEC to be tested to the approved test plan. The Government reserves the right to measure the metrics contained in Exhibit C during the 1000 hour testing; however these are not metrics that have any requirements for the base effort.

iii. C.2.2.1 (i) is revised as follows:

FROM: (i) The contractor shall update the detailed design of the APU system developed and tested during the base effort, and incorporate lessons learned from the 1000 hour validation test in C.2.1.7.

TO: (i) The contractor shall update the detailed design of the APU system developed and tested during the base effort, and incorporate lessons learned from the Government 1000 hour validation test in C.2.1.7.

iv. C.3.3.1 is revised as follows:

FROM: The contractor shall submit a Base Effort draft Technical Report to the COR within 30 business days after the completion of the Base Effort 1000 hour test, but not later than 35 months after award.

TO: The contractor shall submit a Base Effort draft Technical Report to the COR within 30 business days after the completion of the Base Effort and delivery of the system to the Government, but not later than 30 March 2014.

c. Section F:

i. Paragraph F.5.1 performance completion date is revised from 20 November 2013 to 30 April 2014.

ii. Paragraph F.5.4.1 delivery date for the draft technical report is revised from 20 October 2013 to 30 March 2014.

d. Section G: Revised to reflect the accounting changes associated with this modification.

e. Section J: CDRL A003, Block 16, paragraph (a) is revised to extend the submission date for the draft final report from NLT 35 months after contract award to NLT 30 March 2014.

4. As a result of this modification, the obligated amount of the contract is increased by \$469,829 from \$5,525,430 to \$5,995,259.

5. Except as specifically stated above, all other terms and conditions of contract W56HZV-10-C-0348 remain unchanged and in full force and effect.

\*\*\* END OF NARRATIVE A0011 \*\*\*

CONTINUATION SHEET

Reference No. of Document Being Continued  
 PIIN/SIIN W56HZV-10-C-0348 MOD/AMD P00011

Name of Offeror or Contractor: ALTEX TECHNOLOGIES CORPORATION

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT						
0001	<p>SECTION B - SUPPLIES OR SERVICES AND PRICES/COSTS</p> <p><u>BAA TOPIC 21 BASE EFFORT</u></p> <p>GENERIC NAME DESCRIPTION: JP8 FUEL CELL APU SYSTEM                      CLIN CONTRACT TYPE:                      Cost Plus Fixed Fee</p> <p>Contractor shall furnish all the supplies and services to accomplish the task specified in Section C (Base), C.1 through C.2.1.8.3, Scope of Work.</p> <p>Est. Cost: \$5,353,644.00*                      Fixed Fee: \$ 341,867.00                      Total Amount: \$5,695,511.00*</p> <p>* Amount revised by Modification P00011</p> <p>(End of narrative B001)</p> <p><u>Inspection and Acceptance</u>                      INSPECTION: Destination ACCEPTANCE: Destination</p> <p><u>Deliveries or Performance</u></p> <table border="0"> <tr> <td>DLVR SCH</td> <td>PERF COMPL</td> </tr> <tr> <td><u>REL CD</u>                      <u>QUANTITY</u></td> <td><u>DATE</u></td> </tr> <tr> <td>001                                      1</td> <td>30-APR-2014</td> </tr> </table> <p style="text-align: right;">\$ 5,695,511.00</p>	DLVR SCH	PERF COMPL	<u>REL CD</u> <u>QUANTITY</u>	<u>DATE</u>	001                                      1	30-APR-2014	1	LO		\$ 5,695,511.00
DLVR SCH	PERF COMPL										
<u>REL CD</u> <u>QUANTITY</u>	<u>DATE</u>										
001                                      1	30-APR-2014										
000101	<p><u>BAA TOPIC 21 BASE EFFORT</u></p> <p>PRON: R302C105R3 PRON AMD: 04 ACRN: AA                      AMS CD: 622601H9100                      (AMOUNT: \$ 775,000.00)</p>										
000102	<p><u>BAA TOPIC 21 BASE EFFORT</u></p> <p>PRON: R302C106R3 PRON AMD: 04 ACRN: AB                      AMS CD: 63300544100                      (AMOUNT: \$ 1,100,000.00)</p>										

CONTINUATION SHEET

Reference No. of Document Being Continued  
 PIIN/SIIN W56HZV-10-C-0348 MOD/AMD P00011

Name of Offeror or Contractor: ALTEX TECHNOLOGIES CORPORATION

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
000103	<p><u>BAA TOPIC 21 BASE EFFORT</u></p> <p>PRON: R312C011R3 PRON AMD: 04 ACRN: AC                      AMS CD: 63300544100                      (AMOUNT: \$ 2,327,000.00)</p>				
000104	<p><u>BAA TOPIC 21 BASE EFFORT</u></p> <p>PRON: R312C013R3 PRON AMD: 04 ACRN: AD                      AMS CD: 622601H9100                      (AMOUNT: \$ 700,000.00)</p>				
000105	<p><u>BAA TOPIC 21 BASE EFFORT</u></p> <p>PRON: R302C416R3 PRON AMD: 01 ACRN: AB                      AMS CD: 63300553300                      (AMOUNT: \$ 252,210.30)</p>				
000106	<p><u>BAA TOPIC 21 BASE EFFORT</u></p> <p>PRON: R322C038R3 PRON AMD: 02 ACRN: AE                      AMS CD: 622601H9100                      (AMOUNT: \$ 71,471.70)</p>				
000107	<p><u>BAA TOPIC 21 BASE EFFORT</u></p> <p>PRON: R32MC126R3 PRON AMD: 01 ACRN: AG                      (AMOUNT: \$ 65,992.00)</p>				
000108	<p><u>BAA TOPIC 21 BASE EFFORT</u></p> <p>PRON: R32MC127R3 PRON AMD: 01 ACRN: AH                      (AMOUNT: \$ 8,886.00)</p>				
000109	<p><u>BAA TOPIC 21 BASE EFFORT</u></p> <p>PRON: R33MC124R3 PRON AMD: 01 ACRN: AK                      (AMOUNT: \$ 288,792.00)</p>				
000110	<p><u>BAA TOPIC 21 BASE EFFORT</u></p>				

**CONTINUATION SHEET**

**Reference No. of Document Being Continued**  
**PIIN/SIIN** W56HZV-10-C-0348      **MOD/AMD** P00011

**Name of Offeror or Contractor:** ALTEX TECHNOLOGIES CORPORATION

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	PRON: R33MC125R3    PRON AMD: 01    ACRN: AJ (AMOUNT: \$ 106,159.00)				

**CONTINUATION SHEET****Reference No. of Document Being Continued**

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MOD/AMD P00011

**Name of Offeror or Contractor:** ALTEX TECHNOLOGIES CORPORATION**B.1 ESTIMATED COST, FIXED FEE AND PAYMENT**

B.1.1 The estimated cost to the Government for performance of work under the Contract is set forth in Section B under CLIN 0001, which shall constitute the estimated cost for the purpose of the Contract Clause entitled "Limitation of Funds."

B.1.2 The contractor will be paid for the fixed fee stated in Section B under CLIN 0001 for the performance of work under the contract and in accordance with the terms of the Contract Clause entitled "Fixed Fee," FAR 52.216-8. The fixed fee together with the reimbursement of cost shall constitute full and complete consideration for the contractor's service in connection with the work required and performed under this contract.

B.1.3 Allowable costs shall be determined and payment thereof, shall be provided in accordance with the Contract Clause hereof entitled "Allowable Cost and Payment", (Dec 2002), FAR 52.216-7. Contractor may submit public vouchers monthly for payment under this Contract.

**B.2 FUNDING**

B.2.1 The Government shall provide funds under this contract covering the estimated cost and fee hereof on an incremental basis as provided for in the following funding schedule and pursuant to the Contract Clause entitled "Limitation of Funds," FAR 52.232-22. It is estimated that the incremental amounts are sufficient for the performance of work in each of the cited periods. The Government may, at its discretion, allot such funds on an incremental basis within each fiscal year. The contractor shall so plan and execute the work required by this contract as to expend and/or commit funds compatible with the schedule set forth below. Whenever the contractor has reason to believe that the funds allotted to this contract for any fiscal year are either insufficient or excessive for the performance of work required in that fiscal year, the Government shall be so notified.

**B.2.2 FUNDING SCHEDULE**Base Effort\*\*

Performance Period	Amount
Award thru January 2011	\$ 850,000.00
February 2011 thru January 2012	\$1,550,000.00
February 2012 thru January 2013	\$1,400,000.00
February 2013 thru Completion	\$1,425,682.00

Total Negotiated Base\*\* Contract Value: \$5,225,682.00

Cost Overrun\*\*: \$ 469,829.00\*\*

Total Negotiated Base Contract Value \$5,695,511.00\*

Option 3\*\*

Award thru 24 Sept 2013 \$299,748.00

Total Contract Value: \$5,995,259.00

B.3 FUNDS ALLOTTED. The amount of funds currently allotted to this contract is \$5,995,259.00\*.

**B.4 PAYMENT**

B.4.1 The contractor may submit public vouchers monthly for payment under this contract. The fee will be payable at the time of reimbursement of cost at the same rate to such cost as the total fee of this contract bears to the total estimated cost thereof, subject to any withholding pursuant of this contract.

**B.5 AUDIT OF RECORDS**

B.5.1 The Administrative Contracting Officer or his/her authorized representative will perform an accounting system review upon submission of first billing and will also, in accordance with Section I, FAR 52.215-2, Audit of Records - Negotiations, perform an audit of, at a minimum, the contractor's final cost voucher.

\* Revised via modification P00011

\*\* Added for clarification by modification P00011

\*\*\* END OF NARRATIVE B0001 \*\*\*

Name of Offeror or Contractor: ALTEX TECHNOLOGIES CORPORATION

## SECTION C - DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

## C.1 PURPOSE / OBJECTIVES

C.1.1 The objective of this program is to develop a fuel cell based auxiliary power unit (APU) that operates off 100% JP-8 Army logistic fuel (MIL-STD-83133F). The system developed shall include a DC/DC converter whose output is connected to the vehicle DC bus, to which the vehicle battery and alternator are also connected. The system must be water neutral; meaning all water requirements for the system (if any) shall be met by internal water recovery with no external sources. The system shall be at Technology Readiness Level (TRL) 5 by the end of the base effort. The Government anticipates this APU to be used on multiple platforms, such as Abrams, Bradley, Medium Tactical Vehicle and/or future vehicles. This will increase available power for critical systems and other auxiliary systems while in a silent watch mode. In addition, quieter operation, reduced engine idling, fuel consumption, acoustic and thermal signature will contribute to improved mobility, survivability and lethality as well as increased operability.

C.1.2 The contractor, acting as an independent contractor and not as an agent of the Government, shall provide the necessary personnel, facilities, materials and services to complete the tasks outlined below.

## C.2 BASE EFFORT

## C.2.1 BASE EFFORT OBJECTIVE/OVERVIEW

The objective of the base program is to design, build, and demonstrate a fuel cell based APU that meets the requirements stated in Exhibit B, System Requirements. Since the sulfur content of JP8 can vary, the COR will locate and identify the JP8 fuel the contractor shall purchase for this effort. The contractor shall use the JP8 identified by the COR.

## C.2.1.1 System Specification and Design

The contractor shall develop a detailed system design for a JP8 Fuel Cell APU that meets the requirements of Exhibit B, and contains milestones and metrics for each component that they will integrate into the JP8 Fuel Cell APU system. The contractor shall design the system to provide 10 kilowatt electric (kWe) (objective), 5 kWe (threshold) of net power, while having a volume of 225 liters and weigh no more than 600 pounds. The contractor shall design the system to operate on JP8 fuel that meets MIL-STD-83133. The contractor shall design a reformer system that consists of a number of subsystems, a Fuel Pre-Processor (FPP) subsystem, a Fuel Processor (FP) subsystem, a Fuel Cell subsystem, and a Control and Power Conditioning System, and that meets all the requirements of Exhibit B.

## C.2.1.1.1 Fuel Pre-Processor (FPP) Subsystem Design

The contractor shall design a FPP that removes sulfur and contaminants in the fuel to levels that do not have a degrading effect to other system components, including the fuel cell. The subsystem shall consist of a Fractionator Module, a Regenerable Organic Sulfur Trap (ROST), and a Polishing Desulfurizer. To accomplish this, the contractor shall complete the following tasks:

## C.2.1.1.1.1 Fractionator Unit Design

(i) Design a fractionator that processes JP8 fuel with sulfur that ranges between 0 and 3000 parts per million (ppm) of sulfur and a poly-aromatic content between 0 and 25%.

## C.2.1.1.1.2 Organic Sulfur Trap (OST) Unit Design

- (i) Design the OST unit to reduce sulfur in JP8 fuel from 1500 parts per million weight (ppmw) to a level below 30 ppmw.  
(ii) Design the OST to remove harmful nitrogen compounds from the fuel that may affect system components.

## C.2.1.1.1.3 Polishing Desulfurizer Unit Design

- (i) Design the polishing OST to reduce sulfur to levels that do not have a degrading effect to other system components, including the fuel cell.  
(ii) Design the polishing OST for a maintenance interval of 200 hours and so that the adsorbent can be easily replaced.

## C.2.1.1.1.4 Integrated FPP Subsystem Design

Develop an integration design for the FPP to combine the fractionator, OST, and polishing modules with the balance of plant (BOP) components to complete the FPP design. The BOP shall include all components necessary to operate the subsystems of the FPP. The FPP design shall provide for steady state operation of the FPP.

## C.2.1.1.2 Fuel Processor (FP) Subsystem Design

The contractor shall design the FP, consisting of burner, prereformer, reformer, water gas shift (WGS) reactor, boiler, and heat exchanger modules. The FP shall take fuel from the FPP and process it to output a fuel reformat capable of being used in a fuel cell.

## C.2.1.1.2.1 Water Gas Shift Reactor (WGS) Design

- (i) The contractor shall design the WGS to reduce Carbon Monoxide (CO) content of the reformat to less than 0.2-1% (wet basis).  
(ii) The contractor shall analyze the benefits of using air cooling versus oil cooling of the WGS, select the cooling method that best meets the overall APU system requirements, and utilize the best option for the design of the WGS.

**Name of Offeror or Contractor:** ALTEX TECHNOLOGIES CORPORATION**C.2.1.1.2.2 Water Recovery System Design**

(i) The contractor shall design a single water recovery system for the entire APU system that utilizes only water produced by the fuel cell.

(ii) The contractor shall design the water recovery system to avoid freezing the water within the system during cold weather operation to temperatures as low as minus 10 degrees Fahrenheit (F).

**C.2.1.1.2.3 Integrated Fuel Processor (FP) Subsystem Design**

The contractor shall develop an integration design for the FP that combines the burner, pre-reformer, reformer, WGS, and boiler to produce two each 5 kWe fuel processors. Both fuel processors shall be integrated with the single water recovery system, above. Additionally, the FP design shall identify and size the BOP components. Startup of the FP, steady state operation and shutdown procedures, their impact on the design, shall be identified, defined, and included in this design.

**C.2.1.1.3 Reformer Design**

(i) The contractor shall design the integration of the FPP and FP subsystems that will create the reformer. The contractor shall design all BOP components, as well as all interfaces between each module. This task includes the design of packaging/insulating to obtain maximum power density on both weight and volume bases.

(ii) The contractor shall evaluate the full system design and identify any potential issues as well as mitigation strategies.

**C.2.1.1.4 Stack Design**

The contractor shall design a high temperature fuel cell stack that operates at temp range from 102-180 degrees Celsius.

**C.2.1.1.5 Power System Design**

(i) The contractor shall develop an integration design that combines all design components into a complete JP8 Fuel Cell APU, as well as the design of all interfaces between each module, and the control and power strategies that will be used to control the completed power system.

(ii) The contractor shall design the APU system to be placed in a volume shown in Exhibit E. Components of the system shall be designed for placement in an optimal location in relation to air inlet, exhaust, and fuel supply locations.

(iii) The contractor shall design the APU to have sufficient internal air circulation for optimal cooling.

**C.2.1.2 Preprocessor Subsystem Fabrication and Testing**

(i) The contractor shall fabricate and test the FPP components, as follows:

**C.2.1.2.1 Fractionator**

(i) The contractor shall fabricate the fractionator unit.

(ii) The contractor shall conduct baseline testing of the fractionator and optimize its performance.

(iii) The contractor shall develop a test plan for the fractionator that focuses on system performance variations, and submit it to the COR in the next quarterly report in accordance with CDRL A002. The contractor shall test the fractionator and define performance of the fractionators. The test results shall be provided in the next quarterly report.

**C.2.1.2.2 OST**

(i) The contractor shall fabricate the Regenerable OST unit.

(ii) The contractor shall validate the performance of the OST and optimize the OST performance, focusing on the OST absorbent

(iii) The contractor shall develop a test plan for the optimized OST that focuses on operation of the OST and specifically on the effect of JP8 with sulfur levels ranging from 0-3000 ppm on the absorbent. The contractor shall submit the OST test plan to the COR in the next quarterly report in accordance with CDRL A002. The contractor shall test the OST and determine the effect of the sulfur levels in the OSTs performance. The test results shall be provided in the next quarterly report.

**C.2.1.2.3 Polishing Desulfurizer Unit**

(i) The contractor shall fabricate the Polishing Desulfurizer Unit.

(ii) The contractor shall test the Polishing Desulfurizer Unit to verify the unit successfully reduces sulfur levels of 30 ppm down to a level that will not cause harm to the fuel cell.

(iii) The contractor shall the contractor shall optimize the capacity of the polishing adsorbents.

**C.2.1.2.4 Integrated FPP**

(i) The contractor shall integrate all FPP optimized components, all BOP components and all interfaces into a single integrated FPP.

(ii) The contractor shall develop a test plan for the integrated FPP, and submit it to the COR in the next quarterly report in accordance with CDRL A002. Testing shall be to validate system operation; determine the FPP system parameters and control strategies, and to determine the effect of fuel type and sulfur content; testing shall be no less than 100 hours. The contractor shall test the integrated FPP. The test results shall be provided in the next quarterly report.

**C.2.1.3 Fuel Processor (FP) Subsystem and Testing**

The contractor shall fabricate, test, and optimize the performance of the optimized-form-factor FP system, as follows:

Name of Offeror or Contractor: ALTEX TECHNOLOGIES CORPORATION

C.2.1.3.1 Individual Component Optimization and Testing

(i) The contractor shall fabricate the FP components.

(ii) The contractor shall develop a test plan to validate and characterize each component individually prior to integration into the FP subsystem, and submit it to the COR in the next quarterly report in accordance with CDRL A002. The contractor shall characterize the operation of the components. The contractor shall then optimize the components.

(iii) Test results shall be provided in the next quarterly report in accordance with A005.

C.2.1.3.2 FP Subsystem Integration and Testing

(i) The contractor shall integrate all FP components, all BOP components, and interfaces into a single integrated FP.

(ii) The contractor shall develop a test plan for the integrated FPP. The test plan shall characterize the system parameters, control strategies, and validate system operation; test duration shall be no less than 100 hours. The contractor shall submit the test plan to the COR in the next quarterly report in accordance with CDRL A002. The test results shall be provided in the next quarterly report in accordance with A005.

C.2.1.4 Fuel Cell Subsystem

(i) The contractor shall fabricate the high temperature fuel cell stack.

(ii) The contractor shall develop a test plan that:

- (1) Fully characterizes the stack performance;
- (2) Requires use of power levels ranging from 0.5 kWe to 5 kWe.
- (3) Requires 1000 start ups and shut downs;
- (4) Requires a 1200 hour uninterrupted longevity test.

(iii) The contractor shall submit the test plan to the COR in the next quarterly report in accordance with CDRL A002.

(iv) The contractor shall test the high temperature fuel cell stack. The test results shall be provided in the next quarterly report described in C.3.5 and CDRL A005.

C.2.1.5 Control System and Power Conditioning

The contractor shall fabricate the control system and conduct a thermal analysis to ensure electrical components function within the safe operational temperatures specified by the manufacturer for each commercial off the shelf (COTS) component, and within the operational temperatures of each specially designed component.

C.2.1.6 APU System Design Package Prior to component and subsystem integration, the contractor shall submit to the COR the final design package for the Integrated JP8 Fuel Cell APU System, with all components and subsystems, Process Flow Diagrams (PFD), Piping and Instrumentation Diagram (P&ID), and startup procedures in accordance with CDRL A008. The COR will concur within 14 days after receipt of the design package.

C.2.1.7 JP8 Fuel Cell APU Integration and Validation

(i) After receipt of COR concurrence of the design package, the contractor shall integrate the FPP, FP, fuel cell and control system to produce one 10 kWe JP8 Fuel Cell APU.

(ii) The contractor shall validate the performance of the fully integrated system to ensure all the components and subsystems are integrated together properly and the APU system functions properly.

(iii) The contractor shall update the system design package and PFD, P&ID and 3D model files based on refinements made during system integration and validation and submit to the COR with or before the draft final technical report in accordance with CDRL A008.

C.2.1.8 Contractor System Testing and Evaluation

C.2.1.8.1 The contractor shall develop a 1000 hour test plan that includes the testing outlined in Exhibit D and verifies the APU system meets each of the requirements in Exhibit B.

C.2.1.8.2 The contractor shall deliver the 1000 hour test plan to the COR no later than 15 April 2014\* in accordance with CDRL A002. The COR will approve or comment within 5 business days after receipt.

C.2.1.8.3 The contractor shall deliver the fully integrated JP8 Fuel cell APU System to TARDEC to be tested to the approved test plan. The Government reserves the right to measure the metrics contained in Exhibit C during the 1000 hour testing; however these are not metrics that have any requirements for the base effort. \*

<b>CONTINUATION SHEET</b>	<b>Reference No. of Document Being Continued</b>	<b>Page 11 of 19</b>
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The objective of the Option 1 is to advance the technical maturity of the prototype APU system tested in C.2.1.7 to a TRL of 6.

C.2.2.1 System Specs and System Design Upgrade

(i) The contractor shall upgrade the detailed design of the APU system developed and tested during the base effort, and incorporate lessons learned from the Government\* 1000 hour validation test in C.2.1.7. Further, the contractor shall upgrade the APU system design for integration onto a Government vehicle platform while upgrading the system to a TRL 6, and meeting the following additional requirements:

- (1) Operate at temperatures of minus 10 degrees F to 125 degrees F per MIL-STD-705C
- (2) Operate at 4000 feet at rated power and efficiency per MIL-STD-705C
- (3) Accept full electrical load in no longer than 30 minutes (i.e. generate full rated power within 30 minutes)
- (4) Meet full shock and vibration requirements per MIL-STD-810G

Meet 200 hours Mean Time Before Scheduled Maintenance (MTBSM) and 1140 Mean Time Between Failures (MTBF) under laboratory conditions

(ii) The COR will identify which Government vehicle platform will be used within 30 days after exercise of Option 1.

C.2.2.2 Control, Monitoring and Power Conditioning System Upgrade

The contractor shall upgrade the control, monitoring and power conditioning systems in accordance with the upgraded design in C.2.2.1.

C.2.2.3 Power Components TRL Upgrade

The contractor shall upgrade the individual power components to a TRL 6 in accordance with the upgraded design in C.2.2.1.

C.2.2.4 Upgraded JP8 Fuel Cell APU Integration

The contractor shall integrate upgraded Control, Monitoring, Power Conditioning Systems, and the individual power components into a TRL 6 modular JP8 Fuel Cell APU, produce three individual units and validate performance of the units.

C.2.2.5 APU System Design Package

The contractor shall update the final upgraded design package for the upgraded APU System, along with the PFD, P&ID and 3D model files based on refinements made during system integration and validation. The contractor shall submit it to the COR prior to shipping the three upgraded APU systems for Government testing in accordance with CDRL A008. The COR will concur within 14 days after receipt. After receipt of COR concurrence, the contractor shall ship the three upgraded APU Systems.

C.2.2.5 Contractor Vehicle Integration and Government Testing

C.2.2.5.1 Integration and testing of the APU systems shall be performed at either Yuma Proving Grounds (YPG), Cold Regions Test Center (CRTC), Aberdeen Proving Grounds (APG), or TARDEC. The COR will identify which Government test facility will be used within 90 days after the exercise of Option 1. After receipt of COR concurrence of the upgraded design package, the contractor shall ship the three APU systems to the designated Government testing facility and shall integrate the units into the Government supplied vehicles. Integration includes installation, electrical connections, fuel connections and software integration.

C.2.2.5.2 In accordance with CDRL A002, the contractor shall develop a test plan for performance testing that when performed demonstrates the upgraded APU system meets all the requirements of Option 1 described in C.2.2.1. Testing shall be for the duration of 500 miles on vehicles, as well as laboratory testing that documents that the APU system meets the requirements of Option 1 and submit it to the COR 60 days prior to the start of testing described in C.2.2.5.4, below.

C.2.2.5.3 The COR will review and concur with the test plan for the Upgraded APU System within 5 business days after receipt of the plan.

C.2.2.5.4 The Government will conduct testing of the three APU systems after contractor integration onto vehicles. Testing shall be approximately two weeks duration, and consist of 500 miles on vehicles, as well as laboratory testing that documents that the APU system meets the requirements of Option 1. The contractor shall provide on-site technical expertise to keep the APU systems operational throughout the testing at the Government test facilities. Additionally the contractor shall record and analyze the test data. Testing will begin approximately 30 months after exercise of Option 1.

C.2.2.5.5 After completion of Government testing, the contractor shall deliver the three APU systems to TARDEC at the address in Section F.

C.2.2.5.6 Operation and Maintenance Manual

In accordance with CDRL A007, the contractor shall provide an Operation and Maintenance Manual for the upgraded JP8 Fuel Cell APU and submit it to the COR within 30 months after exercise of Option 1. The Operation and Maintenance Manual shall describe safe startup, operation, shutdown, and maintenance of the system. The contractor shall submit the manual electronically and provide three hardcopies, one for each APU system.

**Name of Offeror or Contractor:** ALTEX TECHNOLOGIES CORPORATION**C.2.3 Option II, Design, Build And Demonstrate A Modular JP8 Fuel Cell Apu System**

The objective of the Option 2 is to design, build and demonstrate a modular JP8 Fuel Cell APU comprised of two to five modules with the associated fluid, mechanical and electrical interconnections between the modules to enable non-contiguous installation in a Military vehicle.

**C.2.3.1 System Specs and System Design**

The contractor shall design a modular JP8 Fuel Cell APU system that uses the components developed and testing during the base effort.

**C.2.3.2 Control, Monitoring and Power Conditioning System Refinement for a Modular Power System**

The contractor shall design and fabricate a high fidelity control system and power conditioning system for the modular APU.

**C.2.3.3 Power Components and Subsystems Fabrication**

(i) The contractor shall raise the TRL of the power components and subsystems to a TRL 6.

(ii) The contractor shall fabricate all power system components for a modular power system that still meets the requirements of the base effort described in Exhibit B.

(iii) Prior to shipment and integration of the modular APU System on a vehicle, the contractor shall submit to the COR the final design package for the modular APU System, with all components and subsystems, PFD, P&ID, and startup procedures in accordance with CDRL A008. The COR will concur within 14 days after receipt of the Modular APU System design package.

**C.2.3.4 Vehicle Integration and Test**

(i) Integration and testing of the modular APU system shall be performed at either Yuma Proving Grounds (YPG), Cold Regions Test Center (CRTC), Aberdeen Proving Grounds (APG), or TARDEC. The COR will identify which Government test facility will be used within 90 days after the exercise of Option 2. After receipt of COR concurrence of the design package for the modular APU System, the contractor shall ship the modular APU system to the designated Government testing facility and shall integrate the modules into the Government supplied vehicle. The COR will identify which vehicle system will be used within 30 days after exercise of Option 2. Integration consists of installation of the modular APU system with all electrical connections, fuel connections, and software integration needed to install and run the system on the vehicle.

(ii) In accordance with CDRL A002, the contractor shall develop a test plan for validation testing for the modular APU system on the vehicle at idle, and submit it to the COR 60 days prior to the start of testing described below. Testing shall be for the duration of approximately 20 hours.

(iii) The COR will review and comment or approve the test plan for the modular APU system within 5 business days after receipt. After receipt of COR approval, the contractor shall test the APU system pursuant to the approved test plan. Testing shall begin within 30 months after exercise of Option 2. Upon completion of the testing, the contractor shall remove the APU system from the vehicle, restore the vehicle to its prior configuration and deliver the APU system to the COR at the address in Section F.

(iv) The contractor shall analyze the test results and determine the systems ability to produce reliable power as an Army vehicle mounted APU.

(v) The contractor shall provide a detailed cost estimate to manufacture the entire modular JP8 APU System in a production environment, as a separate section in the Option II final report. The estimate will be based upon a production rate and production total determined by the contractor.

**C.2.3.5 Operation and Maintenance Manual**

In accordance with CDRL A007, the contractor shall provide an Operation and Maintenance Manual for the modular JP8 Fuel Cell APU and submit it to the COR within 30 months after exercise of option 2. The Operation and Maintenance Manual shall describe safe startup, operation, shutdown, and maintenance of the system. The contractor shall submit the manual electronically and provide one hardcopy.

**C.2.4 Option III Effort/ Ruggedize the JP8 Fuel Cell APU**

The objective of the Option 3 Effort is to make improvements to the JP8 Fuel Cell APU system developed during the base effort to meet MIL-STD-810G and conduct shock and vibration testing. The APU system will not be integrated onto a vehicle.

**C.2.4.1 System Specs and System Design**

The contractor shall modify the design of the Base Effort (C.2.1) JP8 Fuel Cell APU system to meet the requirements of MIL-STD-810G.

**C.2.4.2 Power System Upgrade**

The contractor shall modify the APU system produced under the base effort to handle full military vehicle shock and vibration as specified in MIL-STD-810G.

**C.2.4.3 Design Package** Prior to testing described below, the contractor shall submit to the COR the final design package for the ruggedized APU System, with all components and subsystems, PFD, P&ID, and startup procedures in accordance with CDRL A008. The COR will

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concur within 14 days after receipt.

#### C.2.4.4 Power System Testing

The contractor shall develop a test plan for shock and vibration testing to demonstrate that the modified JP8 Fuel Cell APU system meets the requirements of MIL-STD-810G and submit it to the COR, at least 60 days prior to the start of testing in accordance with CDRL A002. Test duration shall be two-three weeks. Additionally the contractor shall record and analyze the test data. The COR will review and comment or approve the shock and vibration test plan for the APU System within 5 business days after receipt. After receipt of COR approval of the design in C.2.4.3 and of the test plan, the contractor shall test the APU system. Testing shall be conducted at contractor facilities within 9 months after exercise of Option 3.

### C.3 DELIVERABLES

#### C.3.1 Meeting Minutes

The contractor shall record all working group minutes from the start of work meeting, program review meetings, all teleconferences and video conferences contributing to the achievement of a milestone. The contractor shall submit the minutes to the COR within five business days after the meeting in accordance with CDRL A001. At the completion of the base effort and each option exercised by the Government, the contractor shall use the details of the minutes to prepare a milestone history and include it in the Final Technical Report (CDRL A003.)

#### C.3.2 Test Plans

The contractor shall develop and maintain currency of all Test Plans that describe the validation, verification and demonstration (VV&D) of components and fully integrated systems. The contractor shall submit the plans to the COR for approval in accordance with CDRL A002, present the plans at a program review and obtain COR concurrence prior to the implementation of these test plans. The test plans shall include identification of all test equipment needed, such as, load banks, the corresponding electrical profiles, operator instructions, trouble-shooting, maintenance manuals, for VV&D on the respective components and systems. The contractor shall include as part of the final technical report, the finalized test plans as concurred with by the COR, test data and analysis.

#### C.3.3 Draft and Final Technical Reports

C.3.3.1 Base Effort: The contractor shall prepare a Technical Report for the base effort and document all the technical aspects and results of the base contract effort, including the cited deliverables, and the results of all analysis therein. The contractor shall submit a Base Effort draft Technical Report to the COR within 30 business days after the completion of the Base Effort and delivery of the system to the Government, but not later than 30 March 2013\*. The COR will review and request any revisions within 15 business days after receipt. The contractor shall deliver the complete Final Technical Report within 15 business days to the COR in accordance with CDRL A003.

C.3.3.2 Option 1: If exercised, the contractor shall prepare a Technical Report for Option 1, and document all the technical aspects and results of Option 1, including the cited deliverables, and the results of all analysis therein. The contractor shall submit the Option 1 Draft Technical Report to the COR within 15 business days after the completion of Option 1 testing, but not later than 35 months after award. The COR will review and request any revisions within 15 business days after receipt. The contractor shall deliver the complete Option 1 Final Technical Report within 15 business days to the COR in accordance with CDRL A003.

C.3.3.3 Option 2: If exercised, the contractor shall prepare a Technical Report for Option 2, and document all the technical aspects and results of Option 2, including the cited deliverables, and the results of all analysis therein. The contractor shall submit the Option 2 Draft Technical Report to the COR within 15 business days after the completion of Option 2 testing, but not later than 35 months after award. The COR will review and request any revisions within 15 business days after receipt. The contractor shall deliver the complete Option 2 Final Technical Report within 15 business days to the COR in accordance with CDRL A003.

C.3.3.4 Option 3: If exercised, the contractor shall prepare a Technical Report for Option 3, and document all the technical aspects and results of Option 3, including the cited deliverables, and the results of all analysis therein. The contractor shall submit the Option 3 Draft Technical Report to the COR within 15 business days after the completion of Option 3 testing, but not later than 11 months after award. The COR will review and request any revisions within 15 business days after receipt. The contractor shall deliver the complete Option 3 Final Technical Report within 15 business days to the COR in accordance with CDRL A003.

#### C.3.4 Product Interface Document

In accordance with CDRL A004 the contractor shall prepare a Product Interface Document (PID) and include it as part of the first quarterly progress report described below. The PID shall clearly define the Altex team members and their specific responsibilities for each component. Additionally, the PID shall define component inputs and outputs that must be matched at interfaces. Additionally, the PID shall define each component performance, volume and other attributes and be time lined.

#### C.3.5 Progress Reports

The contractor shall submit progress reports at the end of every 90 days, beginning 90 days after contract award. These reports shall summarize progress made during the reporting period. The summary shall include funds spent and committed. Additionally, the

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contractor shall report all experiments, detailed findings, gap analyses between deliverables, metrics, milestone problems, and mitigation strategies. The reports shall also include an analysis of the spending versus schedule, spending versus budget and milestones. This report shall be submitted in accordance with CDRL A005.

**C.3.6 Annual Reports**

The contractor shall submit an annual report every 12 months, beginning 12 months after contract award. These reports shall summarize progress made during the past 12 months. The summary shall include funds spent and committed. Additionally, the contractor shall report all experiments, detailed findings, gap analyses between deliverables, metrics, milestone problems, and mitigation strategies. The reports shall also include an analysis of the spending versus schedule, spending versus budget and milestones. This report shall be in accordance with CDRL A006.

**C.3.7 APU System**

**C.3.7.1 Option 1:** The contractor shall deliver and setup for safe operation the APU system developed under Option 1 to TARDEC at the address in Section F within 36 months after exercise of Option 1.

**C.3.7.2 Option 2:** The contractor shall deliver and setup for safe operation the APU system developed under Option 2 to TARDEC at the address in Section F within 36 months after exercise of Option 2.

**C.3.8 Operation and Maintenance Manual**

**C.3.8.1 Option 1:** The contractor shall deliver a systems operation manual for the Option 1 Upgraded APU System within 36 months after exercise of the option. The operation manual shall describe safe startup, operation, shutdown, and maintenance of the system. This manual shall be in accordance with CDRL A007.

**C.3.8.2 Option 2:** The contractor shall deliver a systems operation manual for the Option 2 Modular APU System within 36 months after exercise of the option. The operation manual shall describe safe startup, operation, shutdown, and maintenance of the system. This manual shall be in accordance with CDRL A007.

**C.3.9 Design Package**

**C.3.9.1 Base Effort:** The contractor shall deliver a design package for the fully integrated JP8 Fuel Cell APU System, that includes finalized PFD, P&ID, CAD models, any applicable debugging software and/or source code for testing and debugging, and a complete list of all system components used within the APU system to the COR for review and concurrence prior to subsystem integration into the fully integrated unit. The COR will review and comment within 14 business days of receipt. The contractor shall submit the final design package with refinements made during system integration and validation to the COR with or before the draft final technical report in accordance with CDRL A008.

**C.3.9.2 Option 1 Design Package:** The contractor shall submit a design package for the Option 1 upgraded APU System, updated from the design package for the base effort, that includes finalized PFD, P&ID, CAD models, any applicable debugging software and/or source code for testing and debugging, and a complete list of all system component used within the Option 1 APU System to the COR for review and concurrence prior to shipping the three upgraded APU systems for testing. The COR will concur within 14 days of receipt. The design package shall be in accordance with CDRL A008

**C.3.9.3 Option 2 Design Package:** The contractor shall submit a design package for the Option 2 Modular APU System, updated from the design package concurred with by the COR for the base effort, that includes finalized PFD, P&ID, CAD models, any applicable debugging software and/or source code for testing and debugging, and a complete list of all system component used within the Option 2 Modular APU System to the COR for concurrence. The COR will concur within 14 days of receipt. The design package shall be in accordance with CDRL A008.

**C.3.9.4 Option 3 Design Package:** The contractor shall submit a design package for the Option 3 Ruggedized APU System, updated from the design package concurred with by the COR for the base effort, that includes finalized PFD, P&ID, CAD models, any applicable debugging software and/or source code for testing and debugging, and a complete list of all system component used within the Option 3 Ruggedized APU System to the COR for concurrence. The COR will concur within 14 days of receipt. The design package shall be in accordance with CDRL A008.

**C.3.10 Billing**

The contractor shall provide an electronic copy of all invoicing to the COR at the time of submission into Wide Area Workflow (WAWF).

**C.4 MONITORING AND CONTROL**

**C.4.1 Start of Work Meeting**

The contractor shall initiate a start of work meeting at TARDEC within 15 days after contract award. The contractor shall conduct the start of work meeting within approximately 30 days after contract award at TARDEC. The COR and the contractor shall mutually agree to the date and time of the meeting. At the meeting, the contractor shall review the program plan, requirements and system specifications



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## SECTION F - DELIVERIES OR PERFORMANCE

## F.4 DATA

F.4.1 The contractor shall submit all data items electronically in accordance with the Contract Data Requirements List (CDRL), (DD Form 1423), Exhibit A, to the following addresses:

Dan.Maslach@us.army.mil  
Pamela.J.Thornton@us.army.mil  
and  
Michele.Vaughn@dcma.mil

F.4.2 All items called for in this contract that cannot be submitted electronically, shall be delivered FOB Destination to:

U.S. Army Tank-automotive and Armaments Command  
ATTN: AMSRD-TAR-R, Bldg. 200D, MS 233, Mr. Dan Maslach  
6501 E. 11 Mile Rd.  
Warren, Michigan 48397-5000

## F.5 Schedule:

F.5.1 Performance: All effort required under this contract, including delivery of the final technical report and the fully integrated JP8 Fuel cell APU System\*, shall be completed no later than 30 April 2014\*.

F.5.2 Progress Reports: The contractor shall submit the first quarterly Contract Progress, Status & Management Report (Progress Report) 90 days after contract award date and every 90 days thereafter.

F.5.3 Annual Reports: The contractor shall submit the first Annual Report 12 months after contract award date and every 12 months thereafter.

## F.5.4 Final Report:

F.5.4.1 The contractor shall deliver the draft technical report no later than 30 March 2014\*. The COR will review and provide comments writing within 15 days after receipt of the draft.

F.5.4.2 The contractor shall deliver the final technical report within 15 days after receipt of COR comments.

## F.6 Schedule - Option Requirements:

## F.6.1 Option Performance

F.6.1.1 Option 1: If exercised by the Government, all effort required under Option 1, including delivery of the final technical report, shall be completed within 36 months after date of option exercise.

F.6.1.2 Option 2: If exercised by the Government, all effort required under Option 2, including delivery of the final technical report, shall be completed within 36 months after date of option exercise.

F.6.1.3 Option 3: If exercised by the Government, all effort required under Option 3, including delivery of the final technical report, shall be completed within 12 months after date of option exercise.

F.6.2 Option Progress Reports: The contractor shall continue to submit the quarterly Contract Progress, Status & Management Reports (Progress Reports) every 90 days throughout the performance of all options exercised.

F.6.3 Option Annual Reports: The contractor shall continue to submit the Annual Reports every 12 months throughout the performance of all options exercised.

## F.6.6 Option Final Reports:

## F.6.6.1 Option 1:

F.6.6.1.1 If exercised, the contractor shall deliver the Option 1 draft technical report within 35 months after contract award. The COR

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will review and provide comments writing within 15 days after receipt of the draft.

F.6.6.1.2 The contractor shall deliver the Option 1 final technical report within 15 days after receipt of COR comments.

F.6.6.6.2 Option 2:

F.6.6.2.1 If exercised, the contractor shall deliver the Option 2 draft technical report within 35 months after contract award. The COR will review and provide comments writing within 15 days after receipt of the draft.

F.6.6.2.2 The contractor shall deliver the Option 2 final technical report within 15 days after receipt of COR comments.

F.6.6.3 Option 3:

F.6.6.3.1 If exercised, the contractor shall deliver the Option 3 draft technical report within 11 months after contract award. The COR will review and provide comments writing within 15 days after receipt of the draft.

F.6.6.3.2 The contractor shall deliver the Option 3 final technical report within 15 days after receipt of COR comments.

\* Changed per Mod P00011

\*\*\* END OF NARRATIVE F0001 \*\*\*

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SECTION G - CONTRACT ADMINISTRATION DATA

LINE	PRON/ AMS CD/ MIPR/ <u>ITEM</u>	OBLG <u>STAT</u>	JO NO/ <u>ACCT ASSIGN</u>	ACRN	PRIOR AMOUNT	INCREASE/ DECREASE	CUMULATIVE AMOUNT
000107	R32MC126R3	2	R.0003903.2.1	AG \$	0.00 \$	65,992.00 \$	65,992.00
000108	R32MC127R3	2	R.0003867.2.1	AH \$	0.00 \$	8,886.00 \$	8,886.00
000109	R33MC124R3	2	R.0005719.1.1	AK \$	0.00 \$	288,792.00 \$	288,792.00
000110	R33MC125R3	2	R.0005699.1.1	AJ \$	0.00 \$	106,159.00 \$	106,159.00
NET CHANGE						\$ 469,829.00	

ACRN	ACCOUNTING CLASSIFICATION	INCREASE/ DECREASE
AG	021 201220132040 A60FL 633005441RK02 2550 L034829465 R.0003903.2.1	021001 \$ 65,992.00
AH	021 201220132040 A60FL 622601C05RK02 2550 L034829478 R.0003867.2.1	021001 \$ 8,886.00
AJ	021 201320142040 A60FL 622601H91RK20 2550 L034829426 R.0005699.1.1	021001 \$ 106,159.00
AK	021 201320142040 A60FL 633005441RK20 2550 L034829383 R.0005719.1.1	021001 \$ 288,792.00
NET CHANGE		\$ 469,829.00

NET CHANGE FOR AWARD:	\$	PRIOR AMOUNT OF AWARD	\$	INCREASE/DECREASE AMOUNT	\$	CUMULATIVE OBLIG AMT
		5,525,430.00		469,829.00		5,995,259.00

LINE	ACRN	EDI/SFIS	ACCOUNTING CLASSIFICATION	INCREASE/DECREASE
000107	AG	021	201220132040 A60FL 633005441RK02 2550 L034829465 R.0003903.2.1	021001
000108	AH	021	201220132040 A60FL 622601C05RK02 2550 L034829478 R.0003867.2.1	021001
000109	AK	021	201320142040 A60FL 633005441RK20 2550 L034829383 R.0005719.1.1	021001
000110	AJ	021	201320142040 A60FL 622601H91RK20 2550 L034829426 R.0005699.1.1	021001

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SECTION J - LIST OF ATTACHMENTS

<u>List of</u> <u>Addenda</u>	<u>Title</u>	<u>Date</u>	<u>Number</u> <u>of Pages</u>	<u>Transmitted By</u>
Exhibit A	CONTRACT DATA REQUIREMENTS LIST (CDRL) DD 1423		006	

CONTRACT DATA REQUIREMENT LIST

Form Approval OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 440 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either these addresses. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO.: 0001 D.SYSTEM/ITEM: JP8 Fuel Cell Auxiliary Power Unit  
B. EXHIBIT: A E. CONTRACT/PR NO.: W56HZV-10-C-0348  
C. CATEGORY: Deliverables F. CONTRACTOR: Altex Technologies Corporation

- 
1. DATA ITEM NO.: A001
  2. TITLE OF DATA ITEM: Meeting Minutes
  3. SUBTITLE: Minutes
  4. AUTHORITY: DI-MGMT-81250A
  5. CONTRACT REFERENCE: C.3.1
  6. REQUIRING OFFICE: AMSRD-TAR-R
  7. DD250 REQ: LT
  8. APP CODE: N/A
  9. DIST. STATEMENT REQUIRED: NO
  10. FREQUENCY: As Req'd
  11. AS OF DATE: N/A
  12. DATE OF FIRST SUB: See BLK 16
  13. DATE OF SUBS. SUB : See BLK 16

14. DISTRIBUTION ADDRESSEES: SUBMIT REPORTS ELECTRONICALLY TO THE E-MAIL ADDRESSES SHOWN IMMEDIATELY BELOW:

	DRAFT	/	FINAL
CONTRACTING OFFICER'S REPRESENTATIVE, Dan Maslach, E-MAIL: Dan.Maslach@us.army.mil	0	/	1
ADMINISTRATIVE CONTRACTING OFFICER, Michele Vaughn, E-MAIL: Michele.Vaughn@dcma.mil	0	/	1

15. TOTAL: 0 / 2

16. REMARKS: Contractor shall record all working group minutes from the start of work meeting, program reviews, all teleconferences and video conferences contributing to the achievement of a milestone. Meeting minutes to be recorded and distributed to all parties within 5 business days after meeting.

17. PRICE GROUP: 18. ESTIMATED TOTAL PRICE:

- 
1. DATA ITEM NO.: A002
  2. TITLE OF DATA ITEM: Test Plans
  3. SUBTITLE:
  4. AUTHORITY: Contractor Format
  5. CONTRACT REFERENCE: C.2.1.2.1, C.2.1.2.2, C.2.1.2.4, C.2.1.3.1, C.2.1.3.2, C.2.1.4, , C.2.1.8.2, C.2.2.5.2, C.2.3.4(ii), & C.2.4.4
  6. REQUIRING OFFICE: AMSRD-TAR-R
  7. DD250 REQ: LT
  8. APP CODE: N/A
  9. DIST. STATEMENT REQUIRED: NO
  10. FREQUENCY: See BLK 16
  11. AS OF DATE: See BLK 16
  12. DATE OF FIRST SUB: See BLK 16
  13. DATE OF SUBS. SUB : See BLK 16

14. DISTRIBUTION ADDRESSEES: SUBMIT REPORTS ELECTRONICALLY TO THE E-MAIL ADDRESSES SHOWN IMMEDIATELY BELOW:

	DRAFT	/	FINAL
CONTRACTING OFFICER'S REPRESENTATIVE, Dan Maslach, E-MAIL: Dan.Maslach@us.army.mil	0	/	1

15. TOTAL: 0 / 1

16. REMARKS:

a. Base:

Deliver Fractionator test plan as part of the next quarterly report.  
Deliver Regenerable OST test plan as part of the next quarterly report  
Deliver Integrated FPP test plan as part of the next quarterly report.  
Deliver Individual Component test plan as part of the next quarterly report.  
Deliver FP Subsystem test plan as part of the next quarterly report.  
Deliver Fuel Cell Subsystem test plan as part of the next quarterly report.  
Deliver test plan for fully Integrated APU System NLT 30 mo. after contract award. COR will approve within 5 days.

b. Option 1: Deliver Option 1 test plan to COR 60 days (minimum) prior to testing. COR will approve within 5 business days.

c. Option 2: Deliver Option 2 test plan to COR 60 days (minimum) prior to testing. COR will concur within 5 business days.

d. Option 3: Deliver Option 3 test plan to COR 60 days (minimum) prior to testing. COR will concur within 5 business days.

17. PRICE GROUP: 18. ESTIMATED TOTAL PRICE:

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1. DATA ITEM NO.: A003
2. TITLE OF DATA ITEM: Scientific and Technical Report
3. SUBTITLE: Draft and Final Technical Report
4. AUTHORITY: DI-MISC-80711A
5. CONTRACT REFERENCE: C.3.3
6. REQUIRING OFFICE: AMSRD-TAR-R
7. DD250 REQ: LT, DD for Final
8. APP CODE: N/A
9. DIST. STATEMENT REQUIRED: NO
10. FREQUENCY: See BLK 16
11. AS OF DATE: N/A
12. DATE OF FIRST SUB: See BLK 16
13. DATE OF SUBS. SUB : See BLK 16

14. DISTRIBUTION ADDRESSEES: SUBMIT REPORTS ELECTRONICALLY TO THE E-MAIL ADDRESSES SHOWN IMMEDIATELY BELOW:

	DRAFT	/	FINAL
CONTRACTING OFFICER'S REPRESENTATIVE, Dan Maslach, E-MAIL: Dan.Maslach@us.army.mil	1	/	1
CONTRACT SPECILIAIST, Pamela Thornton, E-MAIL: Pamela.J.Thornton@us.army.mil	0	/	1
CONTRACT SPECILIAIST, Valencia Lane, E-MAIL: Valencila.Lane@us.army.mil	0	/	1
ADMINISTRATIVE CONTRACTING OFFIECR, Michele Vaugn, Michele.Vaughn@dcma.mil	0	/	1

15. TOTAL: 1 / 4

16. REMARKS:

a. Base: Submit Draft final report to COR NLT 30 March 2014\*. COR will provide comments back within 15 days. The final technical report is due 15 days thereafter.

b. Option 1: Draft report due to COR NLT 35 mo. after option exercise. COR will review and comment within 15 days. The final option 1 technical report is due 15 days thereafter.

c. Option 2: Draft report due to COR NLT 35 mo. after option exercise. COR will review and comment within 15 days. The final option 2 technical report is due 15 days thereafter.

d. Option 3: Draft report due to COR NLT 11 mo. after option exercise. COR will review and comment within 15 days. The final option 3 technical report is due 15 days thereafter.

17. PRICE GROUP: 18. ESTIMATED TOTAL PRICE:

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1. DATA ITEM NO.: A004
2. TITLE OF DATA ITEM: Product Interface Document
3. SUBTITLE: PID

- 4. AUTHORITY: DI-MGMT-80227
- 5. CONTRACT REFERENCE: C.3.4
- 6. REQUIRING OFFICE: AMSRD-TAR-R
- 7. DD250 REQ: LT
- 8. APP CODE: N/A
- 9. DIST. STATEMENT REQUIRED: NO
- 10. FREQUENCY: 1 TIME
- 11. AS OF DATE: N/A
- 12. DATE OF FIRST SUB: 15 DADC
- 13. DATE OF SUBS. SUB : N/A

14. DISTRIBUTION ADDRESSEES: SUBMIT REPORTS ELECTRONICALLY TO THE E-MAIL ADDRESSES SHOWN IMMEDIATELY BELOW:

	DRAFT	/	FINAL
CONTRACTING OFFICER'S REPRESENTATIVE, Dan Maslach, E-MAIL: Dan.Maslach@us.army.mil	0	/	1
15. TOTAL:	0	/	1

16. REMARKS:

Provide at start of work meeting and include as part of the first quarterly progress report. PID shall define for each of the contractors team member, specific responsibilities for each component & component inputs and outputs that must be matched at interfaces. PID shall define each component performance, volume & other attributes and define time lined metrics to be used to assess progress towards the project final objective.

17. PRICE GROUP: 18. ESTIMATED TOTAL PRICE:

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- 1. DATA ITEM NO.: A005
- 2. TITLE OF DATA ITEM: Contractor's Progress, Status and Management Report
- 3. SUBTITLE: Progress Report
- 4. AUTHORITY: DI-MGMT-80227
- 5. CONTRACT REFERENCE: C.3.5
- 6. REQUIRING OFFICE: AMSRD-TAR-R
- 7. DD250 REQ: LT
- 8. APP CODE: N/A
- 9. DIST. STATEMENT REQUIRED: NO
- 10. FREQUENCY: Quarterly
- 11. AS OF DATE:
- 12. DATE OF FIRST SUB: 90 DADC
- 13. DATE OF SUBS. SUB: 90 days thereafter

14. DISTRIBUTION ADDRESSEES: SUBMIT REPORTS ELECTRONICALLY TO THE E-MAIL ADDRESSES SHOWN IMMEDIATELY BELOW:

	DRAFT	/	FINAL
CONTRACTING OFFICER'S REPRESENTATIVE, Dan Maslach, E-MAIL: Dan.Maslach@us.army.mil	1	/	1
CONTRACT SPECILAIST, Pamela Thornton, E-MAIL: Pamela.J.Thornton@us.army.mil	0	/	1
CONTRACT SPECILAIST, Valencia Lane, E-MAIL: Valencila.Lane@us.army.mil	0	/	1
ADMINISTRATIVE CONTRACTING OFFIECR, Michele Vaughn, Michele.Vaughn@dcma.mil	0	/	1
15. TOTAL:	1	/	4

16. REMARKS:

- a. No quarterly progress report is required when the annual report is submitted.
- b. Summarize progress made during the period and the funds spent and/or committed. Report all experimental / detailed findings, gap analyses between deliverables, metrics, and milestone, problems, and mitigation strategies.
- c. Include analysis of the spending vs schedule, spending vs budget and milestones.

17. PRICE GROUP: 18. ESTIMATED TOTAL PRICE:

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1. DATA ITEM NO.: A006
2. TITLE OF DATA ITEM: Contractor's Progress, Status and Management Report
3. SUBTITLE: Annual Report
4. AUTHORITY: DI-MGMT-80227
5. CONTRACT REFERENCE: C.3.6
6. REQUIRING OFFICE: AMSRD-TAR-R
7. DD250 REQ: LT
8. APP CODE: N/A
9. DIST. STATEMENT REQUIRED: NO
10. FREQUENCY: Annually
11. AS OF DATE: N/A
12. DATE OF FIRST SUB: 12 months ADC
13. DATE OF SUBS. SUB: See Blk 16

14. DISTRIBUTION ADDRESSEES: SUBMIT REPORTS ELECTRONICALLY TO THE E-MAIL ADDRESSES SHOWN IMMEDIATELY BELOW:

	DRAFT	/	FINAL
CONTRACTING OFFICER'S REPRESENTATIVE, Dan Maslach, E-MAIL: Dan.Maslach@us.army.mil	1	/	1
CONTRACT SPECILAIST, Pamela Thornton, E-MAIL: Pamela.J.Thornton@us.army.mil	0	/	1
CONTRACT SPECILAIST, Valencia Lane, E-MAIL: Valencila.Lane@us.army.mil	0	/	1
ADMINISTRATIVE CONTRACTING OFFIECR, Michele Vaughn, Michele.Vaughn@dcma.mil	0	/	1
15. TOTAL:	1	/	4

16. REMARKS:

a. Submit first report to the COR 12 months after contract award, and every 12 months thereafter. Shall contain summary of the past 12 month performance.

b. No quarterly progress report is required when the annual report is submitted.

17. PRICE GROUP: 18. ESTIMATED TOTAL PRICE:

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1. DATA ITEM NO.: A007
2. TITLE OF DATA ITEM: Operation and Maintenance Manual
3. SUBTITLE: JP8 Fuel Cell APU System Operation Manual
4. AUTHORITY: Contractor Format
5. CONTRACT REFERENCE: C.2.2.5.6, C.2.3.5, C.3.8.1 & C.3.8.2
6. REQUIRING OFFICE: AMSRD-TAR-S
7. DD250 REQ: DD
8. APP CODE: N/A
9. DIST. STATEMENT REQUIRED: NO
10. FREQUENCY: See Blk 16
11. AS OF DATE: N/A
12. DATE OF FIRST SUB: See Blk 16
13. DATE OF SUBS. SUB: See Blk 16

14. DISTRIBUTION ADDRESSEES: SUBMIT REPORTS ELECTRONICALLY TO THE E-MAIL ADDRESSES SHOWN IMMEDIATELY BELOW:

	DRAFT	/	FINAL
CONTRACTING OFFICER'S REPRESENTATIVE, Dan Maslach, E-MAIL: Dan.Maslach@us.army.mil	0	/	1
15. TOTAL:	0	/	1

16. REMARKS:

a. Option 1: Deliver a systems operation manual for the Upgraded APU System within 30 months after exercise of option 1. The manual shall describe safe startup, operation, shutdown, and maintenance of the Option 1 system.

b. Option 2: Deliver a systems operation manual for the Modular APU System within 30 months after exercise of option 2. The manual shall describe safe startup, operation, shutdown, and maintenance of the Option 2 system.

17. PRICE GROUP: 18. ESTIMATED TOTAL PRICE:

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1. DATA ITEM NO.: A008
  2. TITLE OF DATA ITEM: Design Package
  3. SUBTITLE: PFD and P&ID Package
  4. AUTHORITY: DI-IPSC-81432A
  5. CONTRACT REFERENCE: C.2.1.6, C.2.1.7(iii),C.2.1.8.3, C.2.2.5, C.2.3.3, C.2.4.3, C.3.9.1, C.3.9.2, C.3.9.3, & C.3.9.4
  6. REQUIRING OFFICE: AMSRD-TAR-S
  7. DD250 REQ: LT
  8. APP CODE: N/A
  9. DIST. STATEMENT REQUIRED: NO
  10. FREQUENCY: See Blk 16
  11. AS OF DATE: N/A
  12. DATE OF FIRST SUB: See Blk 16
  13. DATE OF SUBS. SUB: See Blk 16

14. DISTRIBUTION ADDRESSEES: SUBMIT REPORTS ELECTRONICALLY TO THE E-MAIL ADDRESSES SHOWN IMMEDIATELY BELOW:

	DRAFT	/	FINAL
CONTRACTING OFFICER'S REPRESENTATIVE, Dan Maslach, E-MAIL: Dan.Maslach@us.army.mil	0	/	1
15. TOTAL:	0	/	1

16. REMARKS:

a. Final reformer design package shall include Process Flow Diagrams (PFD), Piping & Instrumentation Diagram (P&ID), CAD Models, and startup procedures, debugging software &/or source code for testing & debugging, and complete list of all system components used in the APU system.

b. Base:

- (i) Submit initial final package prior to system integration.
- (ii) Submit revised final no later than 35 months after contract award.

c. Option 1: Submit prior to shipment of the upgraded units for integration and testing. COR will concur within 14 days.

d. Option 2: Submit prior to shipment of the modular unit for integration and testing. COR will concur within 14 days.

e. Option 3: Submit no later than 11 months after contract award. COR will concur within 14 days.

17. PRICE GROUP: 18. ESTIMATED TOTAL PRICE:

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1. DATA ITEM NO.: A009
  2. TITLE OF DATA ITEM: Billing
  3. SUBTITLE: Invoices
  4. AUTHORITY:
  5. CONTRACT REFERENCE: C.3.10
  6. REQUIRING OFFICE: AMSRD-TAR-S
  7. DD250 REQ: LT
  8. APP CODE: N/A
  9. DIST. STATEMENT REQUIRED: NO
  10. FREQUENCY: See Blk 16
  11. AS OF DATE: N/A
  12. DATE OF FIRST SUB: See Blk 16
  13. DATE OF SUBS. SUB: See Blk 16

14. DISTRIBUTION ADDRESSEES: SUBMIT REPORTS ELECTRONICALLY TO THE E-MAIL ADDRESSES SHOWN IMMEDIATELY BELOW:

	DRAFT	/	FINAL
CONTRACTING OFFICER'S REPRESENTATIVE, Dan Maslach, E-MAIL: Dan.Maslach@us.army.mil	0	/	1
15. TOTAL:	0	/	1

16. REMARKS:

To be submitted to the COR when submitted to Wide Area Work Flow (WAWF)

17. PRICE GROUP: 18. ESTIMATED TOTAL PRICE: