

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT1. Contract ID Code
Firm Fixed Price

Page 1 Of 8

2. Amendment/Modification No.

0001

3. Effective Date

2014FEB12

4. Requisition/Purchase Req No.

SEE SCHEDULE

5. Project No. (If applicable)

6. Issued By

U.S. ARMY CONTRACTING COMMAND
 JORDAN VANDESTEENE
 WARREN, MICHIGAN 48397-5000
 HTTP://CONTRACTING.TACOM.ARMY.MIL

Code

W56HZV

7. Administered By (If other than Item 6)

Code

EMAIL: JORDAN.M.VANDESTEENE@US.ARMY.MIL

8. Name And Address Of Contractor (No., Street, City, County, State and Zip Code)

9A. Amendment Of Solicitation No.

W56HZV-13-R-0530

9B. Dated (See Item 11)

2014JAN23

10A. Modification Of Contract/Order No.

10B. Dated (See Item 13)

Code

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 2 signed 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)

13. THIS ITEM ONLY APPLIES TO MODIFICATIONS OF CONTRACTS/ORDERS

It Modifies The Contract/Order No. As Described In Item 14.

- A. This Change Order is Issued Pursuant To: _____ The Changes Set Forth In Item 14 Are Made In _____
 The Contract/Order No. In Item 10A.
- B. The Above Numbered Contract/Order Is Modified To Reflect The Administrative Changes (such as changes in paying office, appropriation data, etc.) Set Forth In Item 14, Pursuant To The Authority of FAR 43.103(b).
- C. This Supplemental Agreement Is Entered Into Pursuant To Authority Of: _____
- 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)

15B. Contractor/Offeror

15C. Date Signed

16B. United States Of America

16C. Date Signed

(Signature of person authorized to sign)

By _____ /SIGNED/
(Signature of Contracting Officer)

NSN 7540-01-152-8070

30-105-02

STANDARD FORM 30 (REV. 10-83)

PREVIOUS EDITIONS UNUSABLE

Prescribed by GSA FAR (48 CFR) 53.243

CONTINUATION SHEET	Reference No. of Document Being Continued	Page 2 of 8
	PIIN/SIIN W56HZV-13-R-0530	MOD/AMD 0001

Name of Offeror or Contractor:

SECTION A - SUPPLEMENTAL INFORMATION

Buyer Name: JORDAN VANDESTEEENE
 Buyer Office Symbol/Telephone Number: CCTA-ADEC/(586)282-3530
 Type of Contract: Firm Fixed Price
 Kind of Contract: Service Contracts

*** End of Narrative A0000 ***

1. The purpose of Amendment 0001 to Solicitation W56HZV-13-R-0530 is to update the following areas of section C:

C.2.1.2 (3) FROM:

3. Transmission Shifting: Provides electronic shifting forward and reverse. At minimum, forward gears 1 to 5 should be available to meet the 48kph minimum speed requirement and 1st reverse should be available. Shifting should be performed automatically with the ability to select and maintain a gear.

TO:

3. Transmission Shifting: Provides electronic shifting forward and reverse. At minimum, forward gears 1 to 5 should be available to meet the 48kph speed requirement and 1st reverse should be available. Shifting should be performed automatically with the ability to select and maintain a gear.

C.2.2.1 (1) FROM:

1. Machine control functions requiring electronic control:

- a. Differential Lock On/Off
- b. 4 Wheel Drive On/Off
- c. Suspension Selector
 - I. Loader mode
 - ii. Excavator mode
 - iii. Standard
- d. Lights On/Off
 - I. Headlights
 - ii. Rear Work Lights

TO:

1. Machine control functions requiring electronic control:

- a. Differential Lock On/Off
- b. 4 Wheel Drive On/Off
- c. Suspension Selector
 - I. Loader mode
 - ii. Excavator mode
 - iii. Standard
- d. Lights On/Off
 - I. Headlights
 - ii. Rear Work Lights
- e. Cooling Fan On/Off

C.2.12 FROM:

The contractor shall support Government testing at Aberdeen Test Center (ATC). Full time onsite test support is not required. Contractor support is needed to resolve technical issues related to the system modification to accept the hardware and software changes. Contractor initial response is required within 72 hours. The contractor shall be responsible to resolve functionality and operational issues related to the driveline retrofit and INTERFACES only. The "proof of concept" system is not required to have on-board diagnostic capability.

The Contractor shall provide a recommended System Support Package SSP to support the HMEE-I platform for the duration of the Government test, with his proposal. This recommended SSP shall contain a list of all the recommended parts to include all long lead items for the HMEE-I, recommended quantities of parts and prices. This priced list shall be submitted with the contractor's proposal it will be evaluated and screened with the contractors proposal. The final Government approved SSP will be placed on contract at the time of award. Repairs to the HMEE I platform using this SSP will be the responsibility of the Government.

CONTINUATION SHEET	Reference No. of Document Being Continued PIIN/SIIN W56HZV-13-R-0530 MOD/AMD 0001	Page 3 of 8
---------------------------	---	---------------------------

Name of Offeror or Contractor:

TO:

The contractor shall support Government testing at Aberdeen Test Center (ATC). Full time onsite test support is not required. Contractor support is needed to resolve technical issues related to the system modification to accept the hardware and software changes. Contractor initial response is required within 72 hours. The contractor shall be responsible to resolve functionality and operational issues related to the driveline retrofit and INTERFACES only. The "proof of concept" system is not required to have on-board diagnostic capability.

- 2. Delete CLIN 0021 - System Support Package
- 3. All other terms and conditions of Solicitation W56HZV-13-R-0530 remain unchanged and in full force and effect.

*** END OF NARRATIVE A0002 ***

CONTINUATION SHEET

Reference No. of Document Being Continued
PIIN/SIIN W56HZV-13-R-0530 **MOD/AMD** 0001

Name of Offeror or Contractor:

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0021	SECTION B - SUPPLIES OR SERVICES AND PRICES/COSTS <u>DELETED</u>				

CONTINUATION SHEET	Reference No. of Document Being Continued	Page 5 of 8
	PIIN/SIIN W56HZV-13-R-0530	MOD/AMD 0001

Name of Offeror or Contractor:

SECTION C - DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

C.1 SCOPE

C.1.1 The Government will furnish one HMEE-I, serial number GEOHMEE1P91063175 to be used for the incorporation of the Electronic Driveline Modification. Throughout this Scope of Work, this designated HMEE-I will be referred to as the modified HMEE-I.

C.1.2 The period of performance of this contract shall be 19 months from the date of contract award.

C.1.3 The contractor shall design a combined software and hardware solution which permits electronic control of the HMEE-I driveline and machine control functions (C.2.1). Driveline is defined as functions necessary to accelerate, stop and steer the machine. Machine control functions are defined as messages, warnings and switches that engage the various operating modes (C.2.2) or lights. The contractor is responsible for the vehicle mounted hardware, machine software and the interface adapter that allows the modified HMEE-I to receive driveline signals.

C.1.4 The contractor shall perform an Analysis of Alternatives (AoA) for both the driveline and machine control functions. The analysis shall address varying levels of performance as described by section C.2 (Requirements). Each alternative solution shall include in depth discussion of performance, safety, cost, integration challenges and technical risk. In the event that the software and hardware solution reduces machine capabilities, it shall be identified and explained in the technical analysis.

C.1.5 The contractor shall incorporate the Government accepted driveline solution on the modified HMEE-I (C.2.5). This vehicle shall be capable of operation in both manned and un-manned (activated by an in-cab switch) configurations. Manned operation refers to conventional HMEE operation via mechanical inputs. Unmanned will refer to HMEE-I operation via electronic inputs.

C.1.6 The Government will perform proof of concept testing on the modified HMEE-I. Testing will consist of approximately 75 hours of reliability testing; reliability testing includes manned operation in accordance with Attachment 001- HMEE-I Mission Profile. The focus will be to identify hardware/software failures or functionality issues related to the driveline modifications while incorporating the integrated hardware and software.

C.2 REQUIREMENTS

C.2.1 The contractor shall develop a design proposal package for modification to the HMEE-I that permits unmanned operation. The contractor shall perform an AoA that trades system performance, platform performance, integration, technical risk, safety (hardware and software) and cost (C.4.3).

C.2.1.1 The following parameters should be considered during the design phase to enable electronic operation. These guidelines will be analyzed and evaluated based on characteristics associated with performance, cost, safety, (hardware and software) integration and/or risk. Factors to be considered in the AoA:

- a. The electronic control should not impair conventional machine operation/capability as defined in ATPD-2301 when operated in the manned mode.
- b. It is desired that electronic control does not impair conventional machine operation/capability as defined in Attachment 002- Purchase Description ATPD-2301 when operated in the electronic or unmanned mode.
- c. All electrical, mechanical, pneumatic and hydraulic connections used for changeover between the manned and unmanned modes shall be designed with quick connects.
- d. All driveline components shall be capable of operating in environmental conditions as defined in ATPD-2301.
- e. The HMEE-I modification should be hardened IAW best commercial practice (BSEN 13309 and ISO 13766) against Electromagnetic Environmental Effects in accordance with MIL-STD 461 and MIL-STD-464.
- f. On the Modified HMEE-I, a single operator should be able to switch from the manned (conventional controls) to the unmanned (electronic controls) modes and vice versa; this operation should not exceed five minutes.
- g. Operating speeds for electronic control shall be evaluated at two levels, 8 kph max and 48 kph max. Operating speeds for manned mode will be IAW Attachment 002- Purchase Description ATPD-2301.
- h. Federal Motor Vehicle Safety Standards (FMVSS) compliance for braking, steering and accelerator control is desired for both the manned and unmanned operating modes.

C.2.1.2 Required driveline control functions include:

1. Engine Throttle: Provides electronic control of the throttle, full range of motion required.
2. Engine On/Off: Provides electronic start and stop capability for the engine.
3. Transmission Shifting: Provides electronic shifting forward and reverse. At minimum, forward gears 1 to 5 should be available to meet the 48kph speed requirement and 1st reverse should be available. Shifting should be performed automatically with the ability to select and maintain a gear.
4. Service Brakes: Provides electronic control of the service brakes, full modulation of the brakes is required.
5. Parking Brakes: Provides electronic engagement and disengagement of the parking brakes.
6. Steering:
 - a. Rear Axle Steer Only: Provides electronic steering capability via the rear axle only
 - b. Front Axle Steer (bolt on approach): Provides electronic steering capability of the front wheels using a bolt-on column actuator, or

Name of Offeror or Contractor:

by another suitable method.

- c. Front Axle Steer (drive by wire fully integrated approach): Provides electronic steering capability of the wheels using a fully integrated steer-by-wire methodology.
- d. Rear Axle Steer with Front Axle Steer: Provides the ability to crab steer and 4-wheel steer the HMEE-I. Should be operational with steering approach 2.1.2; 6 (b.) and 2.1.2; 6 (c.).

C.2.2 The contractor shall develop a design package (C.4.3) for the HMEE-I that permits electronic control of select machine functions and the communication of machine warning and operational status. Findings and recommendations shall be presented to the Government during the initial design review.

C.2.2.1 Required machine control, machine warning and status functions includes:

1. Machine control functions requiring electronic control:
 - a. Differential Lock On/Off
 - b. 4 Wheel Drive On/Off
 - c. Suspension Selector
 - i. Loader mode
 - ii. Excavator mode
 - iii. Standard
 - d. Lights On/Off
 - i. Headlights
 - ii. Rear Work Lights
 - e. Cooling Fan On/Off
2. Warnings:
 - a. Suspension Lock-out Warning
 - b. ABS Fault
 - c. Cooling Fan Inhibited
 - d. 4WD Active
 - e. Differential Lock Active
 - f. Critical Error Messages (Electronic Monitoring System)
 - g. Master Stop Warning
 - h. Stabilizer Deployed Warning
3. Status:
 - a. Fuel Level
 - b. Transmission Temperature
 - c. Hydraulic Temperature
 - d. Coolant Temperature
 - e. Oil Pressure
 - f. Voltmeter
 - g. Ground Speed
 - h. Engine Speed
 - i. Gear Selected

C.2.3 The contractor shall provide a vehicle interface connector (SAE J1939 type connector) that allows the Government to send and receive signals between the modified HMEE-I and a Government developed Operator Control Unit (OCU).

C.2.4 The contractor shall provide or make use of an existing in-cab switch that permits switching between manned and unmanned modes of operation.

C.2.5 The contractor shall develop formal designs for the capability identified in C.2.3, C.2.4 and the Government approved concepts described in C.2.1 and C.2.2. The design shall be performed at a level sufficient to provide the Government with a Proof of Concept demonstrator. Government concept approval will be granted or denied at the initial design review.

C.2.6 The contractor shall document details of the electronic control interface, required input and output signals and interoperability information necessary for the Government to develop associated equipment to upgrade the HMEE-I with unmanned driveline control. The contractor is not responsible for the development the robotic applique kit.

C.2.7 The contractor shall procure hardware and software and modify a Government furnished HMEE-I. Modification shall be made in accordance with the Government approved concept for driveline and machine control modifications as required by C.2.1, C.2.2, C.2.3 and C.2.4.

C.2.8 The contractor shall perform a shakedown test of the modified HMEE-I to evaluate speed, braking and steering IAW Attachment 002-Purchase Description ATPD- 2301. Contractor testing shall document and demonstrate that the modified HMEE-I, via electronic signal input, performs all driveline and machine control functions as specified in C.2.1, C.2.2, C.2.3 and C.2.4 (emulation with CANalyser CAPL scripts is acceptable). JCB is not required to perform a complete evaluation of Electromagnetic Environmental Effects in accordance with MIL-STD 461 and MIL STD 464.

CONTINUATION SHEET**Reference No. of Document Being Continued****Page 7 of 8**

PIIN/SIIN W56HZV-13-R-0530

MOD/AMD 0001

Name of Offeror or Contractor:

C.2.9 The contractor shall perform a detailed cost analysis and Bill of Materials (BOM) for each driveline, machine control, warning message and status message. Cost analysis shall be based on 1 unit and 100 units. Cost analysis shall include projected follow-on testing and production release cost to mature the design from Proof of Concept to Production Ready.

C.2.10 The contractor shall develop a Level II Technical Data Package (TDP) for the driveline and machine control hardware and software modifications (C.4.6).

C.2.11 The contractor shall develop a supplemental operators manual to document any changes to the driveline that will impact machine function and provide instruction for electronic control. Contractor format is acceptable.

C.2.12 Contractor Support of Government Testing

The contractor shall support Government testing at Aberdeen Test Center (ATC). Full time onsite test support is not required. Contractor support is needed to resolve technical issues related to the system modification to accept the hardware and software changes. Contractor initial response is required within 72 hours. The contractor shall be responsible to resolve functionality and operational issues related to the driveline retrofit and INTERFACES only. The "proof of concept" system is not required to have on-board diagnostic capability.

C.2.13 The government will furnish one HMEE-I, serial number GEOHMEE1P91063175. The contractor shall ship machine from Aberdeen Test Center to their facility within 180 days of contract award.

C.3 MEETINGS

C.3.1 The contractor shall conduct a start of work meeting within 30 days after contract award. Teleconference for the start of work meeting is permitted.

C.3.2 The contractor shall conduct an Initial Design Review (IDR) Meeting approximately 180 days after contract award at TARDEC in Warren, MI. At this meeting, the contractor shall present the proposed HMEE modifications IAW the requirements defined in C.2.1, C.2.2, C.2.3, C.2.4 and C.2.5 while discussing risks with associated mitigating actions and recommend a path forward. The result of this IDR meeting will be communicated via a written statement from the PCO in regard to approval or a request for a get-well plan.

C.3.3 The contractor shall conduct a Final Design Review (FDR) Meeting 390 days after contract award. At the FDR Meeting, the contractor shall present the HMEE-I modifications and the final configuration and characteristics which will be delivered to the Government for testing (C.2.13). Teleconference for the final design review meeting is permitted.

C.3.4 The contractor shall make personnel available during the Government Test & Evaluation (T&E) Planning meeting (420 days after contract award). Contractor consultation via teleconference is acceptable.

C.4 DELIVERABLES

C.4.1 Start of Work: The contractor shall deliver an agenda 10 days prior to the Start of Work Meeting. JCB shall deliver meeting minutes after the Start of Work Meeting IAW CDRL A001-Meeting Minutes.

C.4.2 Monthly Reports: The contractor shall deliver reports on a monthly basis in accordance with CDRL A003-Contractors Progress Status and Management Report. The monthly reports shall address work progress, work issues, work schedule, unexpected changes and principal investigators.

C.4.3 Initial Design Review: The contractor shall deliver a read-ahead package along with an agenda 15 days prior to the Initial Design Review Meeting. Read ahead package shall include a detailed report IAW CDRL A005, Scientific and Technical Reports, that outlines the proposed designs, analysis of alternatives, risks w/ mitigating actions and recommended path forward. The contractor shall deliver meeting minutes after the Initial Design Review Meeting IAW CDRL A001-Meeting Minutes.

C.4.4 Final Design Review: The contractor shall deliver a read-ahead package along with an agenda one week prior to the Final Design Review Meeting. The contractor shall deliver meeting minutes after the Final Design Review Meeting CDRL A001-Meeting Minutes.

C.4.5 Final Report: The contractor shall submit a detailed report outlining changes to the system and technical attributes of the driveline and machine control modifications. Report shall include:

- a. Technical summary and approach
- b. Modification summary (components removed/newly installed/modified),
- c. Electrical schematics and hydraulic schematics
- d. System information needed for robotic interface; this will include details on the connection and signals for communication.
- e. Itemized cost breakdown by driveline/machine control function and an estimated retrofit cost (bill of materials, labor hours, follow-on testing and production release cost).
- f. Identify system limitations, performance degradation to ATPD-2301(if any) and safety concerns (compared to traditional operation) when operated manually and electronically

CONTINUATION SHEET	Reference No. of Document Being Continued	Page 8 of 8
	PIIN/SIIN W56HZV-13-R-0530 MOD/AMD 0001	

Name of Offeror or Contractor:

g. Report shall document performance of the system when operated with electronic signals (e.g. steering response, brake performance, drivability, etc.).

h. Report is format and delivery shall be IAW CDRL A004-Scientific and Technical Reports

C.4.6 Level II Technical Data Package (TDP): The contractor shall deliver a technical data package that includes 2D and 3D drawings for all software and hardware modifications necessary for RCIS incorporation for the modified HMEE-I. The TDP shall be delivered for the modifications that are approved and incorporated into the modified HMEE-I delivered to Aberdeen Test Center. TDP delivery shall be IAW CDRL A002- Engineering Drawings and Models.

C.4.7 The contractor shall deliver the modified HMEE-I, along with the SSP to Aberdeen Test Center 450 days after contract award to:

Transportation Officer
U.S. Army Aberdeen Proving Grounds, BLDG 507
Attn: U.S. Army Aberdeen Test Center
M/F: TEDT-AT-WFE, Jessica Evans
APG, MD 21005-5059
DODAAC W81C5M

C.4.8 The contractor shall deliver 8 hours of operator/maintenance training to ATC 450 days after contract award. The training shall also include electric-hydraulic modification information already installed on the GFE HMEE-I used to test. The training manual and training shall provide basic driveline details and operating principles to supplement existing technical manuals. Training manual shall be developed and delivered IAW CDRL A007-Training Materials.

C.5 VERIFICATION

C.5.1 Inspection conditions. Government will perform testing IAW Table I (Attachment 003-RCIS Test Table). Unless otherwise specified, all inspections may be conducted at an ambient temperature (between -40F and 120F), at any humidity, solar radiation, precipitation, blowing dust/sand/rain and within the HMEE-I mission profile (Attachment 001).

C.5.2 Test Incident Report (TIRs): The contractor shall provide written responses to Government generated TIRs related to the driveline retrofit IAW CDRL A006- Failure Analysis and Corrective Action Report.

*** END OF NARRATIVE C0001 ***