

2. Amendment/Modification No. P00002	3. Effective Date 2004OCT05	4. Requisition/Purchase Req No. SEE SCHEDULE	5. Project No. (If applicable)
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6. Issued By TACOM WARREN AMSTA-AQ-ABGB ROBERT BEARDSLEE (586)574-8071 WARREN, MICHIGAN 48397-5000 HTTP://CONTRACTING.TACOM.ARMY.MIL EMAIL: BEARDSLR@TACOM.ARMY.MIL	Code	W56HZV	7. Administered By (If other than Item 6) OFFICE OF NAVAL RESEARCH CHICAGO REGIONAL OFFICE 230 SOUTH DEARBORN STREET, ROOM 380 CHICAGO, IL 60605-1595	Code	N62880
			SCD C PAS NONE ADP PT N62880		

8. Name And Address Of Contractor (No., Street, City, County, State and Zip Code) THE OHIO STATE UNIVERSITY RESEARCH FOUNDATION 1960 KENNY ROAD COLUMBUS, OH. 43210-1063 TYPE BUSINESS: Other Educational	<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. DAAE07-03-C-L134
	<input type="checkbox"/>	10B. Dated (See Item 13) 2003SEP29
Code 7A641	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)
NO CHANGE TO OBLIGATION DATA

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

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

KIND MOD CODE: G	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.
<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: FAR 43.103(a)(3): 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) WYMAN E. YOUNG II YOUNGE@TACOM.ARMY.MIL (586)574-8093
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 2004OCT05

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SECTION A - SUPPLEMENTAL INFORMATION

1. Bilateral Modification P00002 has two purposes as follows:
 - a. First, it extends Contract DAAE07-03-C-L134's period of performance through 31 Dec 04.
 - b. Second, it extends the periods in which the Government may exercise any of the options in Section C.3 through 31 Dec 04.
2. Sections B (Supplies or Services and Prices/Costs), Sections C (Description/Specifications/Work Statement), F (Deliveries or Performance), and Exhibit A, Contract Data Requirements List (CDRL, DD Form 1423), Data Item Number A003 (Scientific and Technical Report) have been revised to reflect the Contract extension. The changed pages are attached.
3. Except for the changes resulting from this Modification, all other terms and conditions of this Contract, as previously modified, remain the same.

*** END OF NARRATIVE A 002 ***

CONTINUATION SHEET

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ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT									
0001	<p>SECTION B - SUPPLIES OR SERVICES AND PRICES/COSTS</p> <p><u>HYBRID-ELECTRIC VEHICLE MODELING</u></p> <p>NOUN: TRUCK RESEARCH SECURITY CLASS: Unclassified</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></td> <td>PERF COMPL</td> </tr> <tr> <td><u>REL CD</u></td> <td><u>QUANTITY</u></td> <td><u>DATE</u></td> </tr> <tr> <td>001</td> <td>1</td> <td>31-DEC-2004</td> </tr> </table> <p style="text-align: right;">\$ 728,000.00</p>	DLVR SCH		PERF COMPL	<u>REL CD</u>	<u>QUANTITY</u>	<u>DATE</u>	001	1	31-DEC-2004	1	LO		\$ 728,000.00
DLVR SCH		PERF COMPL												
<u>REL CD</u>	<u>QUANTITY</u>	<u>DATE</u>												
001	1	31-DEC-2004												
000101	<p><u>HYBRID-ELECTRIC VEHICLE MODELING</u></p> <p>NOUN: TRUCK RESEARCH PRON: E132C462EH PRON AMD: 04 ACRN: AA AMS CD: 63300553D11 (AMOUNT: \$ 444,000.00)</p>													
000102	<p><u>HYBRID-ELECTRIC VEHICLE MODELING</u></p> <p>NOUN: 21ST CENTURY TRUCK PRON: R342C237R3 PRON AMD: 01 ACRN: AB AMS CD: 63300553D11 (AMOUNT: \$ 284,000.00)</p>													

Name of Offeror or Contractor: THE OHIO STATE UNIVERSITY RESEARCH FOUNDATION

SECTION C - DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

Hybrid-Electric Vehicle Modeling, Simulation, Experimental Validation and Concept Design

Statement of Work

C.1 Scope of Work: The Contractor shall research and develop modeling, simulation, and validation tools in the areas of Hybrid Optimization, Driving Cycles, Suspension and Chassis, Fuel Cells, and Hybrid Power Management Systems. The contractor is to investigate and determine how military systems could benefit from such tools and their applications. The effort will result in simulation and analysis tools aimed at optimizing the design of hybrid military ground vehicles.

C.2 Tasks: The program is separated into five subtopic areas.

C.2.1 DESIGN SPACE EXPLORATION OF HYBRID GROUND VEHICLE PROPULSION SYSTEMS

C.2.1.1 Analyze Army Truck Platforms.

The contractor shall conduct an analysis using data collected on the MTRV, FMTV, 8X8, and M113 vehicle platforms to determine the most appropriate candidate platform for a design space exploration study. The selected platform shall be based on: 1.) The readily availability of the data to ensure an accurate design space exploration 2.) The feasibility of hybridization of the platform. It is the contractor's responsibility to obtain the information necessary to perform the analysis.

C.2.1.2 Develop Model for Conventional Vehicle Simulation.

The contractor shall develop vehicle/drivetrain models of the conventional (Internal Combustion Engine Configuration) platform selected in C.2.1.1. The models will be generated in a Matlab/Simulink environment. The models will be validated to ensure that the net "loads" on the vehicle are being correctly modeled and as a first step for successful model development of hybrid architecture.

C.2.1.3 Develop Model for Hybrid-Electric Vehicle Simulation.

The contractor shall develop vehicle/drivetrain computer component models of the platform, selected in C.2.1.1, to simulate the series and parallel hybrid-electric vehicles. The models will be generated in a Matlab/Simulink environment. The components will include the control strategy developed in C.2.5.2. The components will focus on energy storage, transformation, and conversion devices in respect to energy domains: chemical, mechanical, and electrical.

C.2.1.4 Conduct Large-Scale Design Space Exploration

The contractor will conduct a large scale design space exploration using the Aetion Design Space Exploration Software. The parameters of the design space search will include: three different architectures (conventional vehicles, series and parallel hybrids); at least two different energy storage systems; and powertrain components organized by power rating and technology. Simulations shall provide estimation of vehicle fuel consumption based on mutually agreed upon performance metrics. The design space exploration will validate results by comparing results with known trends/tendencies for a conventional platform.

C.2.1.5 DELIVERABLES

C.2.1.5.1 A report detailing the results of the analysis in C.2.1.1. The Report shall contain: 1) an analysis of the different platforms from the perspective of a design space exploration; 2) an analysis outlining the potential advantages and disadvantages of hybridization 3) a recommended platform choice and the rationale used to evaluate designs. 4.) the system and subsystem parameters, mission profiles, operational profiles and loading profiles and characteristics for each platform evaluated. If the data cannot be obtained because of classification, the report should name the source where the data may be obtained and the reason for its unavailability, if known.

C.2.1.5.2 A library of computer component models enabling simulation of all-electric, hybrid-electric and conventional (internal combustion engine) trucks. The library will be designed for simulations investigating energy efficiency (fuel economy) and performance characteristics. Library shall be developed in a Matlab/Simulink environment. Software manuals and source code shall be provided. Delivery of the simulator and library models will include: 1) a half-day seminar on the modeling approach, simulator architecture, and operation of the software; 2) a half-day open computer laboratory session in which OSU-CAR staff will assist TACOM/NAC staff in learning to utilize the models.

C.2.1.5.3 A report summarizing the results of the Design Space Exploration in C.2.1.4. The report shall give the top candidate(s) and the next five candidates for each configuration and the performance metrics agreed to in C.2.1.4.

C.2.2 MODELING AND DESIGN TOOLS FOR THE ANALYSIS OF ON-/OFF-ROAD DUTY CYCLES

C.2.2.1 Analyze Army Truck Platforms.

The contractor shall conduct an analysis of the MTRV, FMTV, 8X8, and M113 vehicle platforms to determine the most appropriate candidate platform for a Driving Cycle Generator. The selected platform shall be based on the readily availability of the data to ensure an accurate development of a random driving cycle generator.

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C.2.2.2 Develop Random Driving Cycle.

The contractor shall develop a random driving cycle generator, within the MATLAB programming language, to provide a benchmark for emission, fuel economy, and durability standards. The generator shall be validated with existing data collected in the C.2.2.1 analysis. The contractor shall use actual cycles to ensure robust testing of vehicles in a computer simulation environment.

C.2.2.3 Implement Random Driving Cycle.

The contractor shall implement the random driving cycle generator into a vehicle platform simulation. If the platform is the same as platform chosen for Subtopic 1, the random cycle will be implemented into the design search software. If the platform is different, a vehicle simulator will be developed for this particular platform. This will provide an example of the cycle generator's use and also allow additional validation of the cycle generator software.

C.2.2.4 Conduct Study of Off Road Techniques.

The contractor shall conduct a study of off-road analysis and measurement techniques. The contractor shall focus the study on terrain measurement and characterization as well as mobility modeling techniques, specifically focusing on the vertical excitation of the vehicle. The contractor will make recommendations for off-road measurement and terrain characterization techniques.

C.2.2.5 DELIVERABLES

C.2.2.5.1 A report detailing the results of the analysis in C.2.2.1. The report shall contain 1.) a recommended platform choice and the criteria used to evaluate the platform candidates. 2.) an analysis of the driving cycle data of the different platforms 3) the mission profiles, terrain profiles, vehicle speed trajectory, and driving cycle data for each platform. If the data cannot be obtained, the report should name the source where the data may be obtained and the reason for its unavailability.

C.2.2.5.2 Random Driving Cycle Generator Software written in MATLAB programming language, software manual, software training (1-day short course), and source code.

C.2.2.5.3 Target Platform simulation model with driving cycle generator incorporated, software manual, software training (1-day short course), and source code.

C.2.2.5.4 Report detailing the off-road study conducted in C.2.2.4. The report shall contain 1) a compilation of off-road measurement and terrain characterization techniques. 2) an analysis of off-road measurement and terrain techniques strengths and weaknesses in developing off-road driving cycles. 3) recommendations for off-road measurement and terrain characterization techniques.

C.2.3 DESIGN SPACE EXPLORATION OF GROUND VEHICLE CHASSIS AND SUSPENSION SYSTEMS

C.2.3.1 Analyze Army Truck Platforms.

The contractor shall conduct an analysis on the MTRV, FMTV, 8x8, and M113 vehicle platforms to select an appropriate candidate for chassis and suspension design space exploration. The selected platform shall be based on the readily availability of the data to ensure an accurate development of a chassis and suspension space exploration.

C.2.3.2 Develop ADAMS Model/Simulation.

The contractor shall develop an ADAMS model of the vehicle platform selected in C.2.3.1., for the baseline chassis/suspension system, allowing specification of metrics to be evaluated and parameters to be varied in design space exploration. The contractor shall develop a working ADAMS simulation of the models baseline vehicle.

C.2.3.3 Conduct Design Space Exploration.

The contractor shall conduct a design space exploration. The appropriate ranges for the suspension parameters will be set, the resulting matrix of suspension variants will be evaluated via ADAMS simulations, and the design space will be explored with the Aetion Design Exploration Software. The contractor shall review the baseline simulation (conducted in C.2.3.2) to see if changes should be made to any of the parameters to be varied or metrics used for candidate evaluation.

C.2.3.4 DELIVERABLES

C.2.3.4.1 A report detailing the results of the analysis in C.2.3.1. The written report shall contain: 1) an analysis of the different platforms from the perspective of a design space exploration; 2) an analysis outlining opportunities for improvement and potential risks changes might create; 3) a recommended platform choice and the mission profiles used to evaluate design candidates. 4) explanation of specific metrics used to evaluate the platforms, what suspension system variations will be considered, and how the variations will be parameterized. 5) the data on the platforms, including the suspension, chassis, and steering systems and sub-systems as well as the mission profiles for each platform.

C.2.3.4.2 ADAMS models (computer files) used in all simulations and source code. A report describing the simulation and results.

C.2.3.4.3 A report detailing the results of C.2.3.3. The report shall contain: 1) Results of design space exploration for the chassis and suspension; 2).explanation of the adjustments to the set of parameters or metrics.

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C.2.4 SYSTEM ANALYSIS AND MODELING TOOLS FOR FUEL CELL TRACTION AND APU SYSTEMS

C.2.4.1 Analyze Fuel Cell Technologies.

The contractor shall conduct an analysis of fuel cell technologies to include PEM, SOFC with an emphasis on fuel reformers for fuel processing (Diesel, JP8, others) and intended usage (traction/APU). The contractor shall analyze vehicle platforms, mission profiles and loads, and other factors as appropriate to select candidate configurations for optimal fuel cell technology for the Army.

C.2.4.2 Extend Existing PEM Fuel Cell Stack and System Model.

The contractor shall extend its existing PEM cell stack and system model to include low-frequency dynamics of PEM fuel cells systems. The contractor shall deliver a model of PEM fuel cell system capable of following the load changes as experienced in vehicles, more specifically for traction applications (bandwidth of 10Hz).

C.2.4.3 Develop SOFC Fuel Cell Stack and System Model.

The contractor shall develop a model of SOFC stack and SOFC system. The model will include 1-D spatial effects and thermal dynamics with focus on performance and energy conversion efficiency. The contractor shall deliver a model of SOFC fuel cell stack and SOFC system capable of evaluating spatial effects (1-D) and thermal dynamic (bandwidth of 0.1 Hz) and will deliver documentation for the models.

C.2.4.4 Develop Reformer Models.

The contractor shall develop a model of fuel reformers for Diesel fuel and JP-8. The model will include 1-D spatial effects and thermal dynamics with focus on performance and energy conversion efficiency. The contractor shall deliver a model of fuel reformers for Diesel fuel and JP-8 capable of evaluating spatial effects (1-D) and thermal dynamic (bandwidth of 0.1 Hz) and will deliver documentation for the models example simulation results.

C.2.4.5 Integrate Fuel Cell System and Reformer Models.

The contractor shall integrate stand-alone models described in sub-tasks C.2.4.2, C.2.4.3 and C.2.4.4 into the simulation software of C.2.1. The contractor shall make use of a standardized interface for each of the vehicle sub-system to allow for "plug-and-play" modeling of a large diversity of vehicle architectures. The contractor shall focus specifically on the uniformization of the interface of each fuel cell sub-systems model to comply with the software architecture conventions of the overall vehicle simulation. The contractor shall develop a model of PEM and SOFC fuel cell systems capable of full integration into the simulation environment of C.2.1.

C.2.4.6 Refine Supervisory Control of Fuel Cell System in Overall Vehicle Architecture.

The contractor shall develop supervisory control strategies to allow optimal energy management of a broad class of vehicles equipped with a variety of fuel cell technologies (PEM, SOFC, with and without reformers, traction and APU applications, hybridized with batteries or super capacitors). The contractor shall formulate, implement and test in simulation a uniform energy management paradigm applicable to all vehicle topologies and mission profiles. The contractor shall deliver control software within the software environment of C.2.1 capable of performing energy management for hybridized fuel cell vehicles and will deliver documentation for the control software and example simulation results.

C.2.4.7 Validate Fuel Cell System and Reformer Model.

The contractor shall validate the models developed in sub-tasks C.2.4.1 through C.2.4.4 with experimental data generated in their fuel cell laboratory and/or with data from published sources or provided by 3rd parties. The contractor shall provide documentation and analysis of the validation tests and provide recommendations for model refinements based on this validation.

C.2.4.8 Deliverables

C.2.4.8.1 A report containing: 1) target systems, configurations and sizing for detailed analysis/simulation in C.2.4.1. 2) documentation and analysis of the validation tests and recommendations for model refinements of C.2.4.7.

C.2.4.8.2 A library of computer component models enabling simulation of pure fuel cell, or hybridized fuel cell vehicles. Simulations shall allow estimation of vehicle fuel economy and performance and drivability metrics. Library shall be developed in a Matlab/Simulink environment. Library will consist of Matlab scripts, initialization files, source code, and user manuals.

C.2.4.8.3 Software, documentation, user manuals and source code for the following models: 1) a PEM fuel cell system capable of following the load changes as experienced in vehicles, more specifically for traction applications (bandwidth of 10Hz). 2) a model of SOFC fuel cell stack and SOFC system capable of evaluating spatial effects (1-D) and thermal dynamic (bandwidth of 0.1 Hz) 3) a model of fuel reformers for Diesel fuel and JP-8 capable of evaluating spatial effects (1-D) and thermal dynamic (bandwidth of 0.1 Hz)

C.2.5 HYBRID VEHICLE ENERGY MANAGEMENT STRATEGY DEVELOPMENT AND DEMONSTRATION

C.2.5.1 Develop ECMS Strategy. The contractor shall develop the fundamental physical and mathematical concepts that underlie the ECMS and the derivation of a control strategy. The contractor shall provide a detailed explanation of the ECMS in both conceptual and mathematical aspects and a mathematical description of the recommended control strategy.

C.2.5.2 Develop Generic Control Module for the Design Space Search: The contractor shall develop software providing a generic control

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module suitable for use in the design space search tasks C2.1.3. The module will be implemented in a Matlab/Simulink environment. The module will require knowledge of the simulated driving cycle and other simulation parameters. The contractor shall provide a detailed conceptual and mathematical explanation of the generic control module, its inputs, outputs, parameters, and assumptions, and an electronic copy of the Matlab /Simulink model.

C.2.5.3 Implement ECMS Strategy: The contractor shall adapt the ECMS strategy to a specific vehicle platform configuration selected in conjunction with C2.1.1 and C2.1.4 results while removing any a priori information requirements, implement the algorithm in a Matlab/Simulink environment and integrate the algorithm with the vehicle simulation model. The contractor shall provide a collection of simulation results showing fuel economy under different driving conditions.

C.2.5.4 Develop and Simulate Testing of GIS-Based ECMS Control Strategy: The contractor shall modify and augment the ECMS control strategy to incorporate available GIS databases and sensor information into the energy management control scheme. The contractor will include mathematical modeling of the GIS sensors and database, a mathematical control development, implementation as a Matlab/Simulink model, and simulation testing using existing vehicle models and representative driving cycles. The contractor shall demonstrate the impact on fuel economy a GIS-Based ECMS Control Strategy will have on a hybridized vehicle platform when compared to the same vehicle platform without the ECMS Control Strategy applied.

C.2.5.5 Demonstrate ECMS and GIS-ECMS Control Strategies: The contractor shall provide a demonstration of the ECMS and GIS-ECMS algorithms performance on their technology demonstration platform at a site chosen in conjunction with TACOM. The contractor shall demonstrate the software, graphical user interfaces, and wireless communication capabilities developed to facilitate the performance of the control strategies. The contractor shall demonstrate the improvements in fuel economy obtained with the implementation of the ECMS and GIS-ECMS control strategies.

C.2.5.6 DELIVERABLES

C.2.5.6.1 A written report containing: 1) a detailed explanation of the ECMS in covering both fundamental physical and mathematical concepts and a mathematical description of the control strategy. 2) a detailed conceptual and mathematical explanation of the generic control module, its inputs, outputs, and parameters. 3) the ECMS algorithm adapted to the selected configuration; 4) a collection of simulation results showing fuel economy under different driving conditions 5) a description of the mechanical characteristics of the demonstration platform and the experimental results obtained under different driving conditions. 6) a detailed description of the demonstration in C.2.5.5, its results, and the impact obtained with respect to fuel economy.

C.2.5.6.2 Software, source code, user manuals, and documentation for the following: 1) generic control module model specified in C.2.5.2. 2) Specific ECMS strategy implementation of C.2.5.3. 3) Specific GIS-Based ECMS Control Strategy mathematical models of C.2.5.4.

C.3 OPTIONS

C.3.1 The contractor shall complete additional design space explorations in accordance with the criteria stated in C.2.1. The COR shall specify an additional vehicle platform(s) to be optimized for hybridization within 15 days after exercise of option. The platform selected shall be one of the platforms not selected in C.2.1.1.

Deliverables: Models and simulations; source code; software user manuals; written report documenting the results; one half-day seminar.

Cost: \$65,000 per additional platform.

Option timing: If exercised within 6 months of contract award, duration may be up to 12 months.
If exercised between 6 and 15 months of contract award, duration may be up to 18 months. *

C.3.2 The contractor shall conduct additional analysis of suspension/chassis alternatives and perform design space explorations on vehicle platforms in accordance with the criteria specified in paragraph C.2.3. The COR shall specify the additional vehicle platform(s) to be optimized for suspension/chassis analysis within 15 days after exercise of option. The platform selected shall be one of the platforms not selected in C.2.3.1.

Deliverables: ADAMS models (computer files); source code; software user manuals; written report explaining the modeling and documenting the results.

Cost: \$45,000 per platform.

Option timing: If exercised within 6 months of contract award, duration may be up to 12 months(per platform).
If exercised between 6 and 15 months of contract award, duration may be up to 18 months(per platform). *

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C.3.3 The contractor shall implement a complete PEM fuel cell system (80 kW nominal), with HIL stack implementation and control system development for PEM/HIL fuel cell system. The development, design approach, and test requirements will be mutually agreed upon prior to exercise of this option.

Deliverables: HIL algorithm/model, system topology, hardware specification, Control system architecture, specification of required sensor set, Simulink code for software control system implementation, dSpace real-time control code for laboratory shall be delivered within 30 days.

Cost: \$159,000.

Option timing: If exercised within 6 months of contract award, duration may be up to 18 months.
If exercised within between 6 and 15 months of contract award, duration may be up to 24 months. *

C.4 Training.
All training required in this SOW will be limited to a maximum of 10 students and will be done at TACOM unless COR agrees to change location. TACOM will supply a classroom large enough for the training and a projector with a laptop input.

C.5 DELIVERABLES.
Reporting and Briefings: Quarterly progress briefings will be provided for the base contract and options, if exercised. If Options and baseline task run concurrently, quarterly progress reports will be concurrent. A final report will be prepared and delivered describing all the work done on the baseline task. Reports and software will be in accordance with the Contract Data Requirements List, DD Form 1423. Briefings will be in contractor format and held at the contractor facility.

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*** END OF NARRATIVE C 001 ***

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SECTION F - DELIVERIES OR PERFORMANCE

F.1.1 Data

F.1.2 The delivery schedule for the data items is found on Exhibit A, The Contract Data Requirements List (DD Form 1423).

F.1.3. All data deliverables under this contract shall be delivered electronically to the email addresses specified in the Contract Data Requirements List (CDRL) DD Form 1423.

F.2 Period of Performance

The period of performance of this contract is 31 Dec 04. *

F.3 All software and documents shall be shipped FOB Destination to the following address:

U.S.Army TACOM
6501 E. 11 Mile Road
Attn: AMSTA-TR-N Tom Udvare Mailstop 289
Warren Michigan, 48397-5000

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*** END OF NARRATIVE F 001 ***

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SECTION J - LIST OF ATTACHMENTS

<u>List of Addenda</u>	<u>Title</u>	<u>Date</u>	<u>Number of Pages</u>	<u>Transmitted By</u>
Exhibit A	CONTRACT DATA REQUIREMENTS LIST (DD FORM 1423)	27-SEP-2004	003	

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.

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|---------------------------------|----------------------|--|
| A. CONTRACT LINE ITEM NO.: 0001 | D. SYSTEM/ITEM.....: | |
| B. EXHIBIT: A | E. CONTRACT/PR NO.: | |
| C. CATEGORY.....: | F. CONTRACTOR.....: | |
-
1. DATA ITEM NO.....: A001
 2. TITLE OF DATA ITEM.: Contractor's Progress, Status, and Management Report
 3. SUBTITLE.....: Progress Report
 4. AUTHORITY.....: DI-MGMT-80227
 5. CONTRACT REFERENCE.: SOW(See Block 16)
 6. REQUIRING OFFICE...: AMSTA-TR-N
 7. DD250 REQ.....: DD
 8. APP CODE.....:
 9. DIST. STATEMENT REQUIRED.:
 10. FREQUENCY.....: See Block 16
 11. AS OF DATE.....: See Block 16
 12. DATE OF FIRST SUB.: See Block 16
 13. DATE OF SUBS. SUB.: See Block 16

14. DISTRIBUTION	A. ADDRESSEES	B. COPIES:	DRAFT	FINAL
	Thomas B. Udvare, Contracting Officer's Representative (COR), E-mail: udvaret@tacom.army.mil			1
	Robert Beardslee, Contract Specialist, E-Mail: beardslr@tacom.army.mil **			1
	Gwendolyn Jordan, Administrative Contracting Officer (ACO), E-mail: jordang@onr.navy.mil			1
		15. TOTAL:		3

16. REMARKS:

a. The Contractor shall deliver quarterly progress reports. Reports shall include progress made on working tasks at each quarter. The first report shall be submitted by on hundred and twenty (120) days after the contract award date.

b. Section C in the contract makes reference to deliverable quarterly reports at each task. Specific references include:

<u>TASK 1</u>	<u>TASK 2</u>	<u>TASK 3</u>	<u>TASK 4</u>	<u>TASK 5</u>
C.2.1.5.1	C.2.2.5.1	C.3.4.1	C.2.4.8.1	C.2.5.6.1
C.2.1.5.3	C.2.2.5.4			

c. Complete the reports in accordance with (IAW) Data Item Description (DID) DI-MGMT-80227, "Contractor's Progress, Status, and Management Report." The COR is responsible for accepting or rejecting the "Contractor's Progress, Status, and Management Reports." See DID DI-MGMT-80227, at the Internet address below, for instructions on completing the required report.

<http://assist.daps.dla.mil/docimages/0001/48/17/DI80227.PD8> **

d. Prepare the reports in the Contractor's format. Submit the reports using any of the following electronic formats:

- (1) Files readable using these Microsoft* 97 Office Products (TACOM can currently read OFFICE 97* and lower): Word, Excel, PowerPoint, or Access. Spreadsheets must be sent in a file format that includes all formulae, macro and format information. Print image is not acceptable. Executable files, other than self-extracting compressed files, are unacceptable.
- (2) Files in Adobe PDF (Portable Document Format). Scanners should be set to 200 dots per inch.
- (3) Files in HTML (Hypertext Markup Language). HTML documents must not contain active links to live Internet sites or pages. All linked information must be contained within your electronic report, and be accessible offline.
- (4) Other electronic formats. Before preparing your report in any other electronic format, please e-mail the COR, with an e-mail copy-furnished to amsta-idq@tacom.army.mil, to obtain a decision as to the format's acceptability. This e-mail must be received by the COR not later than ten calendar days before the draft report's due date. All alternate methods must be a no cost to the Government.

NOTES: (a) The above formats may be submitted in compressed form using self-extracting files.

(b) Files may be read-only, password protected.

e. Acceptable media: The Contractor shall submit reports via e-mail. If e-mail is not workable, other acceptable media include 100 or 250 Megabyte Zip*-disk, 3 inch disk, or 650 megabyte CD-ROM. Identify the software application and version used to create each file submitted.

(1) E-MAIL. Maximum size of each e-mail message shall be three and one-half (3.5) megabytes. Any compressed files must be self-extracting, and you must provide appropriate instructions. You may use multiple e-mail messages if necessary, however, you must annotate the subject lines in this manner: "Message 1 of 3, 2 of 3, 3 of 3."

(2) 100 or 250 MEGABYTE ZIP*-DISK, 3 INCH DISK, OR 650 MEGABYTE CD ROM via U.S. Mail or other carrier. The Contractor shall label and all submitted disks with the Contract number, the Contractor's name, address and a contact's phone number.

NOTE: Please select only one medium by which to transmit each report. For instance, do not submit a report via e-mail and 100 megabyte Zip*-disk.

17. PRICE GROUP:

18. ESTIMATED TOTAL PRICE :

* Registered Trademark

** Revised by Modification P00002

- 1. DATA ITEM NO.: A002
- 2. TITLE OF DATA ITEM.: Scientific and Technical Reports
- 3. SUBTITLE : Final Report

- 4. AUTHORITY: DI-MISC-80711A
- 5. CONTRACT REFERENCE: SOW Para C.3
- 6. REQUIRING OFFICE...: AMSTA-TR-N 9. DIST. STATEMENT REQUIRED.: 12. DATE OF FIRST SUB.: See Block 16
- 7. DD250 REQ.....: DD 10. FREQUENCY.....: See Block 16 13. DATE OF SUBS. SUB.: See Block 16
- 8. APP CODE.....: 11. AS OF DATE.....: See Block 16

14. DISTRIBUTION	A. ADDRESSEES	B. COPIES:	DRAFT	FINAL
Thomas B. Udvare, Contracting Officer's Representative (COR), E-mail: udvaret@tacom.army.mil			1	1
Robert Beardslee, Contract Specialist, E-Mail: beardslr@tacom.army.mil **				1
Gwendolyn Jordan, Administrative Contracting Officer (ACO), E-mail: jordang@onr.navy.mil				1
		15. TOTAL:	1	3

16. REMARKS:

a. The Contractor shall deliver one (1) draft "Scientific and Technical Report," fourteen (14) months ** after contract award. The draft report shall include a completed Standard Form (SF) 298 (Report Documentation Page) as the report's cover sheet. The COR shall review the draft report and return it to the Contractor within thirty (30) days of receipt with comments. The Contractor shall submit one (1) final "Scientific and Technical Report" within thirty (30) days after receipt of draft comments.

b. Complete the reports IAW DID DI-MISC 80711A, "Scientific and Technical Reports." The COR is responsible for accepting or rejecting the draft and final reports, and for submitting the approved final report to the Defense Technical Information Center (DTIC), in Ft. Belvoir, VA. See the data item description (DI-MISC-80711A), at the Internet address below, for instructions on completing the required report.

<http://assist.daps.dla.mil/docimages/0002/27/88/80711A.PD4> **

c. Prepare the reports in the Contractor's format. Submit the reports using any of the following electronic formats:

(1) Files readable using these Microsoft* 97 Office Products (TACOM can currently read OFFICE 97* and lower): Word, Excel, PowerPoint, or Access. Spreadsheets must be sent in a file format that includes all formulae, macro and format information. Print image is not acceptable. Executable files, other than self-extracting compressed files, are unacceptable.

(2) Files in Adobe PDF (Portable Document Format). Scanners should be set to 200 dots per inch.

(3) Files in HTML (Hypertext Markup Language). HTML documents must not contain active links to live Internet sites or pages. All linked information must be contained within your electronic report, and be accessible offline.

(4) Other electronic formats. Before preparing your report in any other electronic format, please e-mail the COR, with an e-mail copy-furnished to amsta-idq@tacom.army.mil, in order to obtain a decision as to the format's acceptability. This e-mail must be received by the COR not later than ten calendar days before the draft report's due date. All alternate methods must be a no cost to the Government.

NOTES: (a) The above formats may be submitted in compressed form using self-extracting files.

(b) Files may be read-only, password protected.

d. Acceptable media: The Contractor shall submit reports via e-mail. If e-mail is not workable, other acceptable media include 100 or 250 Megabyte Zip*-disk, 3 inch disk, or 650 megabyte CD ROM. Identify the software application and version used to create each file submitted.

** Revised by Modification P00002

(1) E-MAIL. Maximum size of each e-mail message shall be three and one-half (3.5) megabytes. Any compressed files must be self-extracting, and you must provide appropriate instructions. You may use multiple e-mail messages if necessary, however, you must annotate the subject lines in this manner: "Message 1 of 3, 2 of 3, 3 of 3."

(2) 100 or 250 MEGABYTE ZIP*-DISK, 3 INCH DISK, OR 650 MEGABYTE CD ROM via U.S. Mail or other carrier. The Contractor shall label and all submitted disks with the Contract number, the Contractor's name, address and a contact's phone number.

NOTE: Please select only one medium by which to transmit each report. For instance, do not submit a report via e-mail and 100 megabyte Zip*-disk.

17. PRICE GROUP:

18. ESTIMATED TOTAL PRICE:

* Registered Trademark

** Revised by Modification P00002

1. DATA ITEM NO.: A003
 2. TITLE OF DATA ITEM.: Computer Software Product End Items
 3. SUBTITLE :
 4. AUTHORITY: DI-MCCR-80700
 5. CONTRACT REFERENCE: SOW (See Block 16)
 6. REQUIRING OFFICE...: AMSTA-TR-N 9. DIST. STATEMENT REQUIRED.: 12. DATE OF FIRST SUB.: See Block 16
 7. DD250 REQ.....: 10. FREQUENCY.....: See Block 16 13. DATE OF SUBS. SUB.: See Block 16
 8. APP CODE.....: 11. AS OF DATE.....: See Block 16

14. DISTRIBUTION	A. ADDRESSEES	B. COPIES:	INITIAL	FINAL
Thomas B. Udvare, Contracting Officer's Representative (COR), E-mail: udvaret @tacom.army.mil	U.S. ARMY TACOM		1	1
	AMSTA-TR-N, MS:289	15. TOTAL:	1	1
	Warren, MI 48397-5000			

16. REMARKS:

Contractor shall deliver all software and manuals referenced in the scope of work. Specific references include:

<u>TASK 1</u>	<u>TASK 2</u>	<u>TASK 3</u>	<u>TASK 4</u>	<u>TASK 5</u>
C.2.1.5.2	C.2.2.5.2 C.2.2.5.3	C.2.3.4.2	C.2.4.8.2 C.2.4.8.3	C.2.5.6.2

Content: The contractor shall supply the software user manuals.
 The contractor shall supply the executable and source code of the software.
 Media: The contractor shall supply the software on a CDROM.
 Format: The contractor shall format to a PC based Operating System.

17. PRICE GROUP:

18. ESTIMATED TOTAL PRICE: