


ORDER FOR SUPPLIES OR SERVICES						PAGE 1 OF 2 PAGES		
IMPORTANT: Mark all packages and papers with contract and/or order numbers.								
1. DATE OF ORDER 08/03/2020		2. CONTRACT NO. (If any) 31310020D0004		6. SHIP TO:				
3. ORDER NO. 31310020F0096		4. REQUISITION/REFERENCE NO. RES-20-0123		a. NAME OF CONSIGNEE NUCLEAR REGULATORY COMMISSION				
5. ISSUING OFFICE (Address correspondence to) US NRC - HQ ACQUISITION MANAGEMENT DIVISION MAIL STOP TWFN-07B20M WASHINGTON DC 20555-0001				b. STREET ADDRESS NUCLEAR REGULATORY COMMISSION				
				c. CITY WASHINGTON		d. STATE DC	e. ZIP CODE 20555-0001	
7. TO:				f. SHIP VIA				
a. NAME OF CONTRACTOR INFORMATION SYSTEMS LABORATORIES INC				8. TYPE OF ORDER				
b. COMPANY NAME				<input type="checkbox"/> a. PURCHASE		<input checked="" type="checkbox"/> b. DELIVERY		
c. STREET ADDRESS 8130 BOONE BLVD STE 500				REFERENCE YOUR:		Except for billing instructions on the reverse, this delivery order is subject to instructions contained on this side only of this form and is issued subject to the terms and conditions of the above-numbered contract.		
d. CITY VIENNA				e. STATE VA		f. ZIP CODE 221827745		
9. ACCOUNTING AND APPROPRIATION DATA See Schedule				10. REQUISITIONING OFFICE OFF OF NUCLEAR REG RESEARCH				
11. BUSINESS CLASSIFICATION (Check appropriate box(es)) <input checked="" type="checkbox"/> a. SMALL <input type="checkbox"/> b. OTHER THAN SMALL <input type="checkbox"/> c. DISADVANTAGED <input type="checkbox"/> d. WOMEN-OWNED <input type="checkbox"/> e. HUBZone <input type="checkbox"/> f. SERVICE-DISABLED VETERAN-OWNED <input type="checkbox"/> g. WOMEN-OWNED SMALL BUSINESS (WOSB) ELIGIBLE UNDER THE WOSB PROGRAM <input type="checkbox"/> h. EDWOSB						12. F.O.B. POINT		
13. PLACE OF		14. GOVERNMENT B/L NO.		15. DELIVER TO F.O.B. POINT ON OR BEFORE (Date)		16. DISCOUNT TERMS 30		
a. INSPECTION Destination		b. ACCEPTANCE Destination						
17. SCHEDULE (See reverse for Rejections)								
ITEM NO. (a)	SUPPLIES OR SERVICES (b)			QUANTITY ORDERED (c)	UNIT (d)	UNIT PRICE (e)	AMOUNT (f)	QUANTITY ACCEPTED (g)
	This Task Order is a place holder for the \$10,000 minimum guarantee. This Task Order will be used as the first Task Order that is awarded to your organization. Accounting Info: 2020-C0200-FEEBASED-60-60D003-1032-11-6-154-Continued ...							
18. SHIPPING POINT		19. GROSS SHIPPING WEIGHT		20. INVOICE NO.				17(h) TOTAL (Cont. pages)
21. MAIL INVOICE TO:								
a. NAME						\$0.00		
b. STREET ADDRESS (or P.O. Box)								
c. CITY						\$10,000.00		17(i) GRAND TOTAL
d. STATE						e. ZIP CODE		
22. UNITED STATES OF AMERICA BY (Signature) 				23. NAME (Typed) JEFFREY R. MITCHELL TITLE: CONTRACTING/ORDERING OFFICER				

ORDER FOR SUPPLIES OR SERVICES
SCHEDULE - CONTINUATION

PAGE NO

2

IMPORTANT: Mark all packages and papers with contract and/or order numbers.

DATE OF ORDER

CONTRACT NO.

ORDER NO.

08/03/2020

31310020D0004

31310020F0096

ITEM NO. (a)	SUPPLIES/SERVICES (b)	QUANTITY ORDERED (c)	UNIT (d)	UNIT PRICE (e)	AMOUNT (f)	QUANTITY ACCEPTED (g)
	255A-11-6-154-1032 Period of Performance: 08/01/2020 to 07/31/2025					

TOTAL CARRIED FORWARD TO 1ST PAGE (ITEM 17(H))

\$0.00

AUTHORIZED FOR LOCAL REPRODUCTION
PREVIOUS EDITION NOT USABLE

OPTIONAL FORM 348 (Rev. 4/2006)
Prescribed by GSA FAR (48 CFR) 53.213(f)

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT		1. CONTRACT ID CODE		PAGE OF PAGES 1 20	
2. AMENDMENT/MODIFICATION NO. P00001		3. EFFECTIVE DATE See Block 16C		4. REQUISITION/PURCHASE REQ. NO. RES-21-0068	
6. ISSUED BY US NRC - HQ ACQUISITION MANAGEMENT DIVISION MAIL STOP TWFN-07B20M WASHINGTON DC 20555-0001		CODE NRCHQ		7. ADMINISTERED BY (If other than Item 6) CODE	
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) INFORMATION SYSTEMS LABORATORIES INC 8130 BOONE BLVD STE 500 VIENNA VA 221827745		(x)		9A. AMENDMENT OF SOLICITATION NO.	
				9B. DATED (SEE ITEM 11)	
		x		10A. MODIFICATION OF CONTRACT/ORDER NO. 31310020D0004 31310020F0096	
				10B. DATED (SEE ITEM 13) 08/03/2020	
CODE 960756138		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 amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required) Net Increase: \$200,000.00
See Schedule

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER (Specify type of modification and authority)
X	Bilateral: Acceptance of Task Order 31310020F0096

E. IMPORTANT: Contractor ☐ is not, ☒ is required to sign this document and return 1 copies to the issuing office.

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

The purpose of this modification is utilize the minimum guarantee and award the first task order to Information Systems Laboratories, Inc.

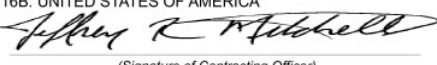
The NRC hereby awards task order 31310020D0004 / 31310020F0096 entitled FAST Code Improvement and Feature Extension.

Total Obligated Amount: \$210,000.00

Total Contract Ceiling: \$303,813.90

Period of Performance: 01/28/2021 to 03/31/2022

Except as provided herein, all terms and conditions of the document referenced in Item 9 A 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) JEFFREY R. MITCHELL TEL: 301-415-5074 EMAIL: Jeffrey.Mitchell@nrc.gov	
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA  (Signature of Contracting Officer)	16C. DATE SIGNED 01/27/2021

B - Supplies or Services/Prices**B.1 BRIEF PROJECT TITLE AND WORK DESCRIPTION**

- (a) The title of this project is: FAST Code Improvement and Feature Extension
- (b) Summary work description: The objective of this acquisition is to obtain modifications to the FAST source code to expand its capability in solving the major physics associated with thermal-mechanical fuel performance, and to ensure the code remains state-of-the-practice in terms of software development practices, code modernization and code functionality.

B.2 CONSIDERATION AND OBLIGATION-TIME-AND-MATERIALS CONTRACT

- (a) The ceiling price to the Government for full performance under this contract is \$303,813.90.
(b)(4)
- (b) The contract includes: (1) direct labor hours at specified fixed hourly rates, inclusive of wages, fringe, overhead, general and administrative expenses, and profit, totaling [REDACTED] and (2) cost of travel totaling [REDACTED] (b)(4)
- (c) The amount presently obligated by the Government with respect to this contract is \$210,000.00.
- (d) It is estimated that the amount currently obligated will cover performance through July 2021.
- (e) This is an incrementally-funded contract and FAR 52.232-22 – “Limitation of Funds” applies.

B.3 PRICE/COST SCHEDULE

BASE						
CLIN	DESCRIPTION	EST. QTY.	UNIT	FIXED UNIT PRICE FY21 [January 28, 2021 – Sept 30, 2021]	FIXED UNIT PRICE FY22 [October 1, 2021 – March 31, 2022]	TOTAL ESTIAMTED AMOUNT (hours x blended rate)
(b)(4) 0001a	Project Manager [REDACTED]	163	Hour	(b)(4)		
(b)(4) 0002a	Subject Matter Expert 1 [REDACTED]	499	Hour			
(b)(4) 0002b	Subject Matter Expert 2 [REDACTED]	386	Hour			
(b)(4) 0003a	Sr. Technical Reviewer 1 [REDACTED]	122	Hour			
(b)(4)	[REDACTED]					

(b)(4)	0003b	Sr. Technical Reviewer 2	243	Hour	(b)(4)		(b)(4)
(b)(4)	0004a	Admin Support and Tech Editing 1	32	Hour			
(b)(4)	0004b	Admin Support and Tech Editing 2	126	Hour			
	0005a	Travel	1	LOT	NTE	NTE	
	0005b	G&A on Travel *	1	LOT	NTE	NTE	
TOTAL ESTIMATED PRICE FOR BASE YEAR							\$303,813.90

* G&A rate is the approved provisional/final rate identified under G.5 2052.216-71 INDIRECT COST RATES. (JAN 1993) of Contract Number 31310020D0004.

Optional Task 3						
CLIN	DESCRIPTION	EST. QTY.	UNIT	FIXED UNIT PRICE FY21 [January 28, 2021 – Sept 30, 2021]	FIXED UNIT PRICE FY22 [October 1, 2021 – March 31, 2022]	TOTAL ESTIAMTED AMOUNT (hours x blended rate)
(b)(4)	1001a Project Manager	60	Hour	(b)(4)		
(b)(4)	2002a Subject Matter Expert 1	120	Hour			
(b)(4)	2002b Subject Matter Expert 2	120	Hour			
(b)(4)	3003a Sr. Technical Reviewer 1	20	Hour			
(b)(4)	3003b Sr. Technical Reviewer 2	100	Hour			
(b)(4)	4004a Admin Support and Tech Editing 1	12	Hour			
(b)(4)	4004b Admin Support and Tech Editing 2	48	Hour			
(b)(4)						
TOTAL ESTIMATED PRICE FOR BASE YEAR						\$89,635.41

TOTAL ESTIMATED PRICE – BASE TASKS	\$303,813.90
TOTAL ESTIAMTED PRICE – OPTIONAL TASK 3	\$89,635.41
TOTAL ESTIMATED PRICE – INCLUSIVE OF ALL OPTIONS	\$393,449.31

C - Description/Specifications

C.1 STATEMENT OF WORK

1. PROJECT TITLE

FAST Code Improvement and Feature Extension

2. BACKGROUND

Recently, the U.S. Nuclear Regulatory Commission (NRC) has sponsored the modernization of its fuel performance codes FRAPCON [3] and FRAPTRAN [4] to use state-of-the-practice Fortran programming practices, culminating in the release of the Fuel Analysis under Steady-state and Transients (FAST) computer code [1, 2] that combines the functions of the FRAP codes. The FAST code assesses the behavior of nuclear fuel under steady-state and transient scenarios. This code is used by the following NRC offices: Office of Nuclear Regulatory Research (RES), Office of Nuclear Reactor Regulation (NRR), and Office of Nuclear Material Safety and Safeguards (NMSS), as well as by numerous governmental, commercial and academic institutions around the world for the analysis of nuclear fuel behavior.

The merger of the FRAPCON and FRAPTRAN codes to create FAST included many improvements to modernize the Fortran source code. This introduced many object-oriented programming practices, including the use of modules and submodules, object polymorphism, and type extension and inheritance. However, additional work is needed to introduce modern Fortran best practices in the code. In particular, the FAST Material Properties Library (MatLib) [2] could be improved in terms of code performance and its ease of maintenance.

FAST – as well as its predecessor codes FRAPCON and FRAPTRAN – solves the governing thermal and mechanical partial differential equations (PDEs) for cylindrical geometries. The code uses a “1.5-dimensional” approach, where the fuel rod is divided into several axial segments and the governing equations are solved in the radial direction for each axial segment. The axial segments are fairly large (on the order of tens of centimeters), which is sufficient for most cases. However, in some situations steep axial temperature gradients are expected, so work is needed to fine-tune the axial nodalization during a simulation to better model the fuel behavior.

FAST often relies on information from other computer codes to provide various boundary conditions, including coolant temperature, pressure, and mass flow rate, as well as the rod power and axial power shape. Typically, a user provides these boundary conditions as input to FAST. However, this approach does not capture feedback between the fuel rod thermal-mechanical behavior calculated by FAST and thermal-fluid and rod power behavior for which other computer codes are needed. To better capture this feedback, NRC and its contractors have made modifications to the FAST source code to allow it to run simultaneously with the TRAC/RELAP Advanced Computational Engine (TRACE) in a coupled multiphysics simulation. This initial effort only allows a user to simulate one FAST fuel rod; further work is needed to extend this capability to multiple rods to perform a coupled FAST-TRACE simulation of a full reactor core. Work is also needed to capture reactor power feedback based on fuel temperatures calculated by FAST and neutronic behavior calculated by TRACE and the Purdue Advanced Reactor Core Simulator (PARCS).

3. PROJECT DESCRIPTION AND OBJECTIVE(S)

The objective of this acquisition is to obtain modifications to the FAST source code to expand its capability in solving the major physics associated with thermal-mechanical fuel performance, and to ensure the code remains state-of-the-practice in terms of software development practices, code modernization and code functionality.

New code requirements:

- Be able to compile and run on Windows, Mac OS and Linux-based (CentOS, Ubuntu) operating systems
- Be able to be compiled using Intel Parallel Studio 2019 (or earlier) and gcc/gfortran-8.0
- Be able to be compiled into a Visual Studio 2019 solution file
- Be able to be freely distributed to the FAST user group members without any restrictions
- Be written in modern fortran (Conform to 2018 standard)
- Be written with full test coverage (unit and integration)
- Conform to FAST's Quality Assurance requirements

There is no restriction to using open-source solvers as long as the open source code can be freely distributed by NRC to the FAST domestic and international User Group and meets the requirements of Section 10. The improvements made to FAST under this contract will be used to ensure that the existing and emerging needs of the NRC are met.

4. STATEMENT OF WORK TASKS

The contractor shall provide all resources necessary to accomplish the tasks and deliverables described in this Statement of Work (SOW). For all tasks that include modifications to the FAST (or MatLib) source code, the contractor shall provide the following:

- Updated FAST source code, tracked via the Git version control system, and verified using the Github Actions continuous integration workflow in the FAST repository; source must be well commented
- Updated FAST Code Description and MatLib documentation to describe new physics, functionality, formatting, etc. to be used by FAST's code users; the Code Description and MatLib documents are created from LaTeX files and a Python script that are included in the Github repository for FAST
- Updated FAST developer documentation describing the functionality and details into how it was implemented / how it can be updated in the future
- Test cases that show the functionality of the new code (this is in addition to the required unit & integration tests per FAST's QA procedures as mentioned in Section 3)

Task 1 – Participation in Project Kick-off Meeting

The work requested compliments work performed by NRC staff as well as work performed under contract with Pacific Northwest National Laboratory, Idaho National Laboratory and Information System Laboratories. A project kick-off meeting will be organized by the COR to bring all stakeholders together for introductions and a discussion of the roles, responsibilities and schedules for the work planned for each entity. The contractor shall prepare a draft Task Order Project Plan, which includes dates, POCs and deliverables for each requested task for presentation at the Kick-off meeting. The Kick-Off meeting will be conducted virtually within 30 days of the award. A final Task Order Project Plan, incorporating discussions and decisions of the Kick-off meeting, shall be provided within 14 days of the Kick-off meeting.

Task 2 – Develop 1D axial grid refinement for existing 1.5D solvers

There are certain scenarios where the grid in a FAST calculation will need to change as a result of rapid and localized changes in the physics. One such example is during a core reflood, where the fuel rod will go from a state of nearly adiabatic heat-up to being quenched by water. In these scenarios, it is common for there to be significant (several hundred degree) axial temperature differences over very small distances, with very different clad-to-coolant heat transfer regimes. One approach to analyzing this is by using smaller grids during these scenarios and larger grids at other times to reduce the computational burden of not always acting on the small grid.

The current 1.5D cylindrical representation in FAST uses a static grid for the simulation. The contractor shall develop the ability for the fuel rod to allow the grid to be refined during the calculation as required by significant axial temperature or heat transfer gradients. This involves reallocating the arrays and other data structures that contain the state of the fuel rod as a function of axial elevation to increase array size and to initialize the arrays with the appropriate information based on the current state of the simulation. Renodalization shall be triggered when a user-

specified axial temperature gradient is exceeded at any point during a simulation. The COR will provide guidance regarding an appropriate thermal gradient to use in test cases.

The contractor shall update the FAST source code to implement this feature, update the Code Description document [1] with the new format requirements, provide a test problem that uses this capability, and update the development documentation to allow for future NRC developer updates.

Task 3 – Develop the ability for FAST to back up to a previous time step [OPTIONAL]

FAST has the ability to write out a text file that can be used to restart a calculation. However, there are situations where the code can run into numerical problems during a simulation that could be resolved by backing up to an earlier time step and continuing the simulation using a reduced time step size, without stopping code execution.

To deal with these situations, the contractor shall implement the ability for FAST to store the state of a fuel rod for several previous timesteps in memory and to allow the code to back up to an earlier time step when code convergence errors occur. The contractor shall demonstrate the capability to back up and restart from a previous time step saved in memory by writing verification tests that demonstrate the following:

- One test shall back a simulation up one time step and resume the calculation from that point, using the same time step size. If all simulation variables from the previous time step are stored correctly, the code results from before and after the time step backup should be the same.
- A second test shall demonstrate the capability to back up to a previous time step and reduce the time step size when the code fails to converge. The COR will provide the contractor with an input file that fails due to convergence issues to demonstrate this capability.

Task 4 – Update MatLib

The contractor shall update MatLib (the material library used by FAST) [2] to ensure it is both operating efficiently (in terms of memory access / speed) and designed using appropriate object-oriented design patterns. More specifically, the contractor shall review the source code for MatLib to evaluate whether or not it is appropriately using type extension, polymorphism, abstraction, and data hiding. The contractor shall identify potential improvements to speed up the code and to ensure it complies with modern Fortran best practices. After consultation with the COR, the contractor shall implement the improvements they have identified. If possible, MatLib (and/or the calls into MatLib) shall be designed to be parallel using Coarray Fortran (CAF).

In addition to the source code updates, the contractor shall update the Code Description document [1] and MatLib documentation [2] with the new format requirements, provide examples of each of the code's new functionalities, and update the development documentation to allow for future NRC developer updates.

Task 5 – Assist in linking FAST to TRACE

The contractor shall assist the NRC in the coupling of FAST with TRACE. Preliminary work to couple FAST to the TRACE reactor systems code through the MOOSE code (i.e., BlueCRAB) developed by Idaho National Laboratory was completed previously. The contractor shall expand the capabilities of the coupled code as follows:

- The contractor shall perform any code modifications necessary for multiple instances of FAST to interface with multiple TRACE components within one simulation.
- The contractor shall modify FAST to pass fuel temperature information to TRACE through MOOSE and to receive axial and radial power profiles from MOOSE.
- The contractor shall work with FAST, TRACE, and MOOSE developers to modify FAST to allow for a PICARD time integration scheme to be available to users who use FAST in BlueCRAB. This effort will require modifying FAST to allow MOOSE to back up the calculation to a previous time step if code convergence problems arise

during execution of the coupled FAST-TRACE simulation. Code backup may be triggered by numerical problems in either TRACE or FAST.

The contractor shall perform the above tasks in coordination with NRC staff and with its contractors at Idaho National Laboratory.

In addition to the source code updates, the contractor shall update the Code Description document [1] to describe this new functionality, provide an example problem (in coordination with NRC staff) to demonstrate the coupled FAST-TRACE capabilities of each of the code's new capabilities, and update the developer documentation to allow for future NRC developer updates.

Task 6 – Provide Training to NRC Staff and Contractors

The contractor shall provide up-to a 2 ½ day training course to the NRC and other FAST developer staff outlining the code modifications and modern Fortran techniques used to perform the FAST source code updates. The objective of the training course is to ensure NRC staff and contractors understand the code modifications proposed in Tasks 2-5 and have some facility with the modern Fortran techniques utilized in the code modifications. A course agenda shall be coordinated with and approved by the COR at least two weeks ahead of the training to ensure all desired subjects will be covered. The NRC staff and contractors should finish the course with a basic understanding of the value and benefit of the modern Fortran techniques and be able to apply the techniques in their own programming efforts. The training shall provide explanation of the code modifications and modern Fortran techniques, address alternative approaches and the benefits offered by the selected approach and allow time for NRC staff questions about the modification and techniques. The training shall take place in the final two months of the POP, following completion of the majority of work requested in Tasks 2-5. The training be conducted virtually between the hours of 8 am and 5 pm ET and include 6.5 hours of instruction or lecture and 1.5 hours for breaks.

The training shall be recorded by the contractor in subject modules and video files shall be provided to NRC for future use. The contractor shall confirm with the NRC COR on what video file type is supported at the NRC. Training presentation materials and recordings provided under this task will become property of the government (NRC) and not subject to any restrictions on use.

The maximum number of staff attending the training sessions is 10 attendees.

Task 7 – Provide Technical Assistance Related to FAST Code Development

The contractor shall provide up to 120 hours of on-call assistance to the NRC staff related to FAST code development activities that are not specifically outlined in the above tasks. Examples of such support may include the following:

- Assistance when NRC staff experiences issues compiling the FAST source code using different compilers (e.g., gfortran, Intel) and on multiple operating systems (e.g., Windows 10, MacOSX, Red Hat Enterprise Linux)
- Assistance in adding new tests or source code files to the Cmake-based build system for FAST
- Assistance when NRC staff has issues with the continuous integration test suite that is run any time new code is added to Github
- Assistance in implementing object-oriented programming features in the FAST source code.

5. APPLICABLE DOCUMENTS AND STANDARDS

The governing equations used in the FAST code are those found in both of the following manuals:

1. IE Porter, KJ Geelhood, DV Colameco, EE Torres, WG Luscher, L Kyriazidis, CC Goodson, "FAST-1.0: A Computer Code for Thermal-Mechanical Nuclear Fuel Analysis under Steady-state and Transients", March 2020. PNNL-29720. Available at <https://fast.labworks.org/software/fast-10>.

2. KJ Geelhood, WG Luscher, IE Porter, L Kyriazidis, CE Goodson, EE Torres, "MatLib-1.0: Nuclear Material Properties Library", March 2020. PNNL-29728. Available at <https://fast.labworks.org/software/fast-10>.
3. KJ Geelhood, WG Luscher, PA Raynaud, IE Porter, "FRAPCON-4.0: A Computer Code for the Calculation of Steady-State, Thermal-Mechanical Behavior of Oxide Fuel Rods for High Burnup", September 2016. PNNL-19418, Vol. 1 Rev. 2. frapcon.labworks.org/Code-documents/FRAPCON_Description_Final.pdf
4. KJ Geelhood, WG Luscher, JM Cuta and IA Porter, "FRAPTRAN-2.0: A Computer Code for the Transient Analysis of Oxide Fuel Rods", May, 2016. PNNL-19400, Vol. 1 Rev. 2. frapcon.labworks.org/Code-documents/FRAPTRAN-2.0-A_Computer_Code_for_the_Transient_Analysis_of_Oxide_Fuel_Rods.pdf

6. DELIVERABLES AND DELIVERY SCHEDULE/REPORTING REQUIREMENTS

Monthly Letter Status Report (MLSR)

The contractor shall provide a Monthly Letter Status Report which consists of a technical progress report and financial status report. This report will be used by the Government to assess the adequacy of the resources proposed by the contractor to accomplish the work contained in this SOW and provide status of contractor progress in achieving tasks and producing deliverables. The report shall include contract/order summary information, work completed during the specified period, milestone schedule information, problem resolution, travel plans, and staff hour summary. The contractor shall provide the MLSRs in electronic format, unless directed by the COR. The electronic format shall be provided using a Microsoft-based product, (e.g., Outlook, Word, Excel, PowerPoint) unless the COR and the contractor specifically agree on another format.

Deliverables

The contractor shall provide the deliverables stated in the table below. In addition to the deliverables and format described in the table, the contractor shall provide a letter report in electronic format describing the work performed and explaining the products delivered to the COR. The electronic format shall be provided using a Microsoft-based product, (e.g., Outlook, Word, Excel, PowerPoint) unless the COR and the contractor specifically agree on another format. The letter report shall be in the format of draft version, revision version with redline/strikeout, and a revised version which can be the final version. The contractor shall maintain appropriate revision control in an electronic format.

For each "final" deliverable (e.g., preliminary, draft, or final) that accomplishes a specific portion of a subtask activity, the contractor shall provide an electronic copy to the COR. The contractor shall explicitly state in its submittal that the product provided is the deliverable for Task/Subtask XX, as further described below.

The schedule for deliverables shall be contained in the approved Project Plan for the task order effort, which is included as a deliverable in the table below.

The contractor shall develop (as necessary), maintain, and control data, files, information, and deliverables pursuant to this task order.

Deliverable Schedule

Deliverable	Description	Quantity/Media	Completion Date
1 (Task 1)	Task Order Project Plan	As applicable	NLT 14 calendar days after kickoff meeting
2 (Task 2)	FAST source code files, test cases, and documentation	Fortran files; text files; LaTeX files	NLT 30 calendar days prior to

			contract expiration
3 (Task 3)	FAST source code files, test cases, and documentation	Fortran files; text files; LaTeX files	NLT 30 calendar days prior to contract expiration
4 (Task 4)	FAST source code files, test cases, and documentation	Fortran files; text files; LaTeX files	NLT 30 calendar days prior to contract expiration
5 (Task 5)	FAST source code files, test cases, and documentation	Fortran files; text files; LaTeX files	NLT 30 calendar days prior to contract expiration
6 (Task 6)	2.5 day training course	Training course materials, and virtual delivery, including recording of course by course module.	NLT 30 calendar days prior to contract expiration
7 (Task 7)	Technical Assistance	Documented in the MLSR	As applicable
8	MLSR in accordance with Section F.3. and Attachment 5 of the base contract.	electronic	20 th of each month

The above deliverables shall be submitted to the task order CO and task order COR. Unless otherwise directed by the COR or the CO, the contractor must provide all deliverables except the Monthly Letter Status Reports (MLSR) as draft products. The COR will review all draft deliverables (and coordinate any internal NRC staff review, if needed) and provide comments back to the contractor. The contractor shall revise the draft deliverable based on the comments provided by the COR and then deliver a revised version of the deliverable, which will then be considered the Final Version. When mutually-agreed upon between the contractor and the COR, the contractor may submit preliminary or partial drafts to help gauge the contractor's understanding of the particular work requirement. More than one round of drafts may be needed if the contractor does not successfully incorporate the COR's comments on the previous draft.

7. REQUIRED LABOR CATEGORIES

Example Labor categories

Labor Category	Minimum Qualification Requirement	Key Personnel* (yes or no)
Project Manager (PM)	Desired Qualifications Requirements: 1. B.S. in Engineering, Science 2. 5 years of software development project management and oversight experience	Yes
Senior Key Staff	Minimum Qualifications Requirements: 1. A Bachelor's degree in an Engineering discipline or Computer Science. 2. More than 10 years' experience in Fortran and C/C++ 3. Proven in-depth knowledge of heat transfer and fluid dynamics 4. Experience in recent (2008 draft standard or more current) Fortran code development practice	Yes

	<ol style="list-style-type: none"> 5. Experience with Object-Oriented Programming, including the following concepts: <ul style="list-style-type: none"> ○ Data abstraction, ○ Object polymorphism, ○ Type extension and inheritance 6. Experience with code verification, testing and version control 7. Experience with the FRAPCON/FRAPTRAN and/or FAST codes <p>Education and Skillsets that are not Required, but Desired for this Task Order Requirement:</p> <ol style="list-style-type: none"> 1. Experience with the following: <ul style="list-style-type: none"> ○ Intel and gcc/gfortran compilers ○ GIT ○ Cmake ○ Microsoft Visual Studio 2. Experience in code development using the 2018 Fortran standard 3. Experience with Object-Oriented Programming, including the following concepts: <ul style="list-style-type: none"> ○ Parallel programming and MPI 	
--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

*See NRCAR 2052.215-70, "Key Personnel"

8. GOVERNMENT-FURNISHED PROPERTY

The COR will grant contractor access to the Github repository containing the FAST source code.

9. PLACE OF PERFORMANCE

The work to be performed under this contract/order will be primarily performed at the location of the contractor's facilities.

10. SPECIAL CONSIDERATIONS

11.1 TRAVEL/MEETINGS

To meet the objectives of this project, periodic programmatic progress and planning meetings may be necessary. It is anticipated that most of these meetings can be conducted via teleconference. However, in-person meetings may be beneficial to discuss progress and next steps during the contract. The contractor shall plan for no more than two in-person meetings during the period of performance. Each meeting shall involve no more than two staff and shall last no longer than two days.

Contractor will be authorized travel expenses consistent with the substantive provisions of the Federal Travel Regulation (FTR) and the limitation of funds specified in this contract/order. All travel requires written Government approval from the CO, unless otherwise delegated to the COR.

Travel will be reimbursed in accordance with FAR 31.205-46, "Travel costs" and the General Services Administration's Federal Travel Regulations at: <http://www.gsa.gov/portal/content/104790>.

All travel requires prior written approval from the COR.

11.2 SECURITY

Work on this task order may involve the handling of documents that contain proprietary information. The contractor shall safeguard documents containing proprietary information against unauthorized disclosure. After completion of work, the contractor must either destroy the documents or return them to the NRC. If they are destroyed, please confirm this in an e mail to the COR with a copy to the CO and include the date and manner in which the documents were destroyed.

11.3 LICENSE FEE RECOVERY

All work under this task order is not license fee recoverable.

11.4 DATA RIGHTS

The NRC shall have unlimited rights to, and ownership of all deliverables provided under this contract/order, including reports, recommendations, briefings, work plans and all other deliverables. All documents and materials, to include the source codes of any software, produced under this contract/order are the property of the Government with all rights and privileges of ownership/copyright belonging exclusively to the Government. These documents and materials may not be used or sold by the contractor without written authorization from the CO. All materials supplied to the Government shall be the sole property of the Government and may not be used for any other purpose. This right does not abrogate any other Government rights. The definition of "unlimited rights" is contained in Federal Acquisition Regulation (FAR) 27.401, "Definitions." FAR clause at FAR 52.227-14, "Rights in Data-General," is hereby incorporated by reference and made a part of this contract/order.

11.5 REQUIRED MATERIALS/FACILITIES

The contractor is responsible for obtaining the following materials, facilities, hardware, or software required for this contract/order:

- Intel Parallel Studio XE 2018 Composer (or newer) Edition for Fortran
- Visual Studio 2017 (or newer)
- gfortran 8.2 (or newer)

D - Packaging and Marking

D.1 PACKAGING AND MARKING

(a) The Contractor shall package material for shipment to the NRC in such a manner that will ensure acceptance by common carrier and safe delivery at destination. Containers and closures shall comply with the Surface Transportation Board, Uniform Freight Classification Rules, or regulations of other carriers as applicable to the mode of transportation.

(b) On the front of the package, the Contractor shall clearly identify the contract number under which the product is being provided.

(c) Additional packaging and/or marking requirements are as follows:
31310020D0004_31310020F0096.

D.2 BRANDING

The Contractor is required to use the statement below in any publications, presentations, articles, products, or materials funded under this contract/order, to the extent practical, in order to provide NRC with recognition for its involvement in and contribution to the project. If the work performed is funded entirely with NRC funds, then the contractor must acknowledge that information in its documentation/presentation.

Work Supported by the U.S. Nuclear Regulatory Commission (NRC), Office of Nuclear Regulatory Research, under Contract/order number 31310020D0004_31310020F0096.

F - Deliveries or Performance

F.1 PLACE OF DELIVERY-REPORTS

The items to be furnished hereunder shall be delivered, with all charges paid by the Contractor, to:

Name: Michelle.Bales@nrc.gov; Lucas.Kyriazidis@nrc.gov

Contracting Officer's Representative (COR)

Name: Jeffrey.Mitchell@nrc.gov

Contracting Officer (CO)

F.2 TASK/DELIVERY ORDER PERIOD OF PERFORMANCE (SEP 2013)

This order shall commence on January 28, 2021 and will expire on March 31, 2022.

G - Contract Administration Data

G.1 ELECTRONIC PAYMENT (DEC 2017)

The Debt Collection Improvement Act of 1996 requires that all payments except IRS tax refunds be made by Electronic Funds Transfer. Payment shall be made in accordance with FAR 52.232- 33, entitled "Payment by Electronic Funds Transfer-System for Award Management."

To receive payment, the contractor shall prepare invoices in accordance with NRC's Billing Instructions. Claims shall be submitted through the Invoice Processing Platform (IPP) (<https://www.ipp.gov/>). Back up documentation shall be included as required by the NRC's Billing Instructions.

H - Special Contract Requirements

H.1 USE OF PERMANENT AND LOANER DEVICE SOLUTIONS DURING INTERNATIONAL TRAVEL (FEB 2020)

In order to ensure the secure use of mobile devices by contractors while on official international travel, the NRC has implemented the following requirements. These policies establish best practices in accordance with Management Directive 12.5, "NRC Cybersecurity Program."

NRC-assigned Permanent Laptops

Due to security risks, NRC-assigned permanent laptops shall not be used for international travel by contractors for any reason.

NRC-assigned Loaner Laptops

NRC loaner laptops specifically configured for international travel, if provided, are the only NRC-provided mobile equipment that may be used by contractors while on official agency international travel. Under the NRC's Agency-Wide Mobility Policy, loaner tablets and mobile phones are not provided to contractors. All NRC loaner devices will be wiped of all data upon returning from each international trip.

Personal Devices

The use of personal laptops, tablets and mobile phones while on official international travel is not prohibited. However, if a contractor is using a personal device to perform work for the NRC while on international travel, the contractor must leverage an NRC authorized solution (Citrix Remote Desktop, IBM MaaS360, Microsoft Office 365 (O365)) to access NRC information.

Personal International Travel

The NRC does not support requests for loaner laptops, tablets or mobile phones while contractor employees are on personal international travel.

H.2 CONTRACTOR CONDUCT (APRIL 2020)

The contractor will ensure that all contractor staff receive anti-harassment training before being granted facility access. The Government reserves the right to deny or restrict facility access for any Contractor employee who engages in any conduct that the agency believes adversely affects the work place. The imposition of a restriction or prohibition shall not excuse the Contractor from performance of obligations under the contract.

H.3 WHISTLEBLOWER PROTECTION FOR NRC CONTRACTOR AND SUBCONTRACTOR EMPLOYEES

(a) The U.S. Nuclear Regulatory Commission (NRC) contractor and its subcontractor are subject to the Whistleblower Employee Protection public law provisions as codified at 42 U.S.C. 5851. NRC contractor(s) and subcontractor(s) shall comply with the requirements of this Whistleblower Employee Protection law, and the implementing regulations of the NRC and the Department of Labor (DOL). See, for example, DOL Procedures on Handling Complaints at 29 C.F.R. Part 24 concerning the employer obligations, prohibited acts, DOL procedures and the requirement for prominent posting of notice of Employee Rights at Appendix A to Part 24 entitled: "Your Rights Under the Energy Reorganization Act".

(b) Under this Whistleblower Employee Protection law, as implemented by regulations, NRC contractor and subcontractor employees are protected from discharge, reprisal, threats, intimidation, coercion, blacklisting or other employment discrimination practices with respect to compensation, terms, conditions or privileges of their employment because the contractor or subcontractor employee(s) has provided notice to the employer, refused to engage in unlawful practices, assisted in proceedings or testified on activities concerning alleged violations of the Atomic Energy Act of 1954 (as amended) and the Energy Reorganization Act of 1974 (as amended).

(c) The contractor shall insert this or the substance of this clause in any subcontracts involving work performed under this contract.

H.4 GREEN PURCHASING (SEP 2015)

(a) In furtherance of the sustainable acquisition goals of Executive Order (EO) 13693, "Planning for Federal Sustainability in the Next Decade," products and services provided under this contract/order shall be energy efficient (EnergyStar® or Federal Energy Management Program - FEMP-designated products), water efficient, biobased, environmentally preferable (excluding EPEAT®-registered products), non-ozone depleting, contain recycled content, or are non- or low toxic alternatives or hazardous constituents (e.g., non-VOC paint), where such products and services meet agency performance requirements. See: Executive Order (EO) 13693, "Planning for Federal Sustainability in the Next Decade."

(b) The NRC and contractor may negotiate during the contract term to permit the substitution or addition of designated recycled content products (i.e., Comprehensive Procurement Guidelines - CPG), EPEAT®-registered products, EnergyStar®- and FEMP designated energy efficient products and appliances, USDA designated biobased products (Biopreferred® program), environmentally preferable products, WaterSense and other water efficient products, products containing non- or lower-ozone depleting substances (i.e., SNAP), and products containing non- or low-toxic or hazardous constituents (e.g., non-VOC paint), when such products and services are readily available at a competitive cost and satisfy the NRC's performance needs.

(c) The contractor shall flow down this clause into all subcontracts and other agreements that relate to performance of this contract/order.

H.5 KEY PERSONNEL. (JAN 1993)

(a) The following individuals are considered to be essential to the successful performance of the work hereunder:

(b)(4)	

*The contractor agrees that personnel may not be removed from the contract work or replaced without compliance with paragraphs (b) and (c) of this section.

(b) If one or more of the key personnel, for whatever reason, becomes, or is expected to become, unavailable for work under this contract for a continuous period exceeding 30 work days, or is expected to devote substantially less effort to the work than indicated in the proposal or initially anticipated, the contractor shall immediately notify the contracting officer and shall, subject to the concurrence of the contracting officer, promptly replace the personnel with personnel of at least substantially equal ability and qualifications.

(c) Each request for approval of substitutions must be in writing and contain a detailed explanation of the circumstances necessitating the proposed substitutions. The request must also contain a complete resume for the proposed substitute and other information requested or needed by the contracting officer to evaluate the proposed substitution. The contracting officer and the project officer shall evaluate the contractor's request and the contracting officer shall promptly notify the contractor of his or her decision in writing.

(d) If the contracting officer determines that suitable and timely replacement of key personnel who have been reassigned, terminated, or have otherwise become unavailable for the contract work is not reasonably forthcoming, or that the resultant reduction of productive effort would be so substantial as to impair the successful completion of the contract or the service order, the contract may be terminated by the contracting officer for default or for the convenience of the Government, as appropriate. If the contracting officer finds the contractor at fault for the condition, the contract price or fixed fee may be equitably adjusted downward to compensate the Government for any resultant delay, loss, or damage.

H.6 CONTRACTING OFFICER'S REPRESENTATIVE

(a) The contracting officer's authorized representative hereinafter referred to as the Contracting Officer's Representative (COR) for this contract is:

Contracting Officer's Representative (COR):

Michelle Bales
Michelle.Bales@nrc.gov
 301-415-1783

Alt Contracting Officer's Representative:

Lucas Kyriazidis
 301-415-7834
Lucas.Kyriazidis@nrc.gov

(b) Performance of the work under this contract is subject to the technical direction of the NRC COR. The term technical direction is defined to include the following:

(1) Technical direction to the contractor which shifts work emphasis between areas of work or tasks, authorizes travel which was unanticipated in the Schedule (i.e., travel not contemplated in the Statement of Work or changes to specific travel identified in the Statement of Work), fills in details, or otherwise serves to accomplish the contractual statement of work.

(2) Provide advice and guidance to the contractor in the preparation of drawings, specifications, or technical portions of the work description.

(3) Review and, where required by the contract, approve technical reports, drawings, specifications, and technical information to be delivered by the contractor to the Government under the contract.

(c) Technical direction must be within the general statement of work stated in the contract. The project officer does not have the authority to and may not issue any technical direction which:

(1) Constitutes an assignment of work outside the general scope of the contract.

(2) Constitutes a change as defined in the "Changes" clause of this contract.

(3) In any way causes an increase or decrease in the total estimated contract cost, the fixed fee, if any, or the time required for contract performance.

(4) Changes any of the expressed terms, conditions, or specifications of the contract.

(5) Terminates the contract, settles any claim or dispute arising under the contract, or issues any unilateral directive whatever.

(d) All technical directions must be issued in writing by the COR or must be confirmed by the COR in writing within ten (10) working days after verbal issuance. A copy of the written direction must be furnished to the contracting officer. A copy of NRC Form 445, Request for Approval of Official Foreign Travel, which has received final approval from the NRC must be furnished to the contracting officer.

(e) The contractor shall proceed promptly with the performance of technical directions duly issued by the project officer in the manner prescribed by this clause and within the COR's authority under the provisions of this clause.

(f) If, in the opinion of the contractor, any instruction or direction issued by the COR is within one of the categories defined in paragraph (c) of this section, the contractor may not proceed but shall notify the contracting officer in writing within five (5) working days after the receipt of any instruction or direction and shall request that contracting officer to modify the contract accordingly. Upon receiving the notification from the contractor, the contracting officer shall issue an appropriate contract modification or advise the contractor in writing that, in the contracting officer's opinion, the technical direction is within the scope of this article and does not constitute a change under the "Changes" clause.

(g) Any unauthorized commitment or direction issued by the COR may result in an unnecessary delay in the contractor's performance and may even result in the contractor expending funds for unallowable costs under the contract.

(h) A failure of the parties to agree upon the nature of the instruction or direction or upon the

contract action to be taken with respect to the instruction or direction is subject to 52.233-1 - Disputes.

(i) In addition to providing technical direction as defined in paragraph (b) of the section, the project officer shall:

(1) Monitor the contractor's technical progress, including surveillance and assessment of performance, and recommend to the contracting officer changes in requirements.

(2) Assist the contractor in the resolution of technical problems encountered during performance.

(3) Review all costs requested for reimbursement by the contractor and submit to the contracting officer recommendations for approval, disapproval, or suspension of payment for supplies and services required under this contract.

(End of Clause)

SECTION J - List of Documents, Exhibits and Other Attachments

J.1 List of Documents, Exhibits, and Other Attachments

Attachments:

- | | |
|------------------------------------------|--------------------------|
| 1. Monthly Letter Status Report Template | (Furnished Upon Request) |
| 2. Labor Hour Billing Instructions | (Furnished Upon Request) |

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT		1. CONTRACT ID CODE		PAGE OF PAGES 1 3	
2. AMENDMENT/MODIFICATION NO. P00002		3. EFFECTIVE DATE See Block 16C		4. REQUISITION/PURCHASE REQ. NO. ZEROREQ-RES-21-0205	
5. PROJECT NO. (If applicable)		6. ISSUED BY US NRC - HQ ACQUISITION MANAGEMENT DIVISION MAIL STOP TWFN-07B20M WASHINGTON DC 20555-0001		7. ADMINISTERED BY (If other than Item 6)	
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) INFORMATION SYSTEMS LABORATORIES INC 8130 BOONE BLVD STE 500 VIENNA VA 221827745		(x)		9A. AMENDMENT OF SOLICITATION NO.	
CODE 960756138		FACILITY CODE		9B. DATED (SEE ITEM 11)	
		x		10A. MODIFICATION OF CONTRACT/ORDER NO. 31310020D0004 31310020F0096	
				10B. DATED (SEE ITEM 13) 08/03/2020	

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended. ☐ is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or electronic communication which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by letter or electronic communication, provided each letter or electronic communication 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 Schedule

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation 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:
X	D. OTHER (Specify type of modification and authority) 52.243-2 Changes-Cost-Reimbursement

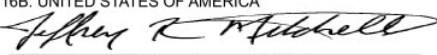
E. IMPORTANT: Contractor ☐ is not ☒ is required to sign this document and return 1 copies to the issuing office.

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

The purpose of this modification is to add two new labor categories into the price/cost schedule with no impact on the contract ceiling. The two new labor categories is an Engineer and Intern 1. All other terms and conditions remain unchanged.

Period of Performance: 01/28/2021 to 03/31/2022

Except as provided herein, all terms and conditions of the document referenced in Item 9 A 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) JEFFREY R. MITCHELL	
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA  (Signature of Contracting Officer)	16C. DATE SIGNED 06/28/2021

Previous edition unusable

STANDARD FORM 30 (REV. 11/2016)
Prescribed by GSA FAR (48 CFR) 53.243

The purpose of this modification is to add two new labor categories into the price/cost schedule with no impact on the contract ceiling. The two new labor categories is an Engineer and Intern 1. All other terms and conditions remain unchanged.

Refer to Section B.3 entitled "PRICE/COST SCHEUDLE" is deleted in its entirety and replaced with the following:

B.3 PRICE/COST SCHEDULE

BASE						
CLIN	DESCRIPTION	EST. QTY.	UNIT	FIXED UNIT PRICE FY21 [January 28, 2021 – Sept 30, 2021]	FIXED UNIT PRICE FY22 [October 1, 2021 – March 31, 2022]	TOTAL ESTIAMTED AMOUNT (hours x blended rate)
(b)(4)	0001a Project Manager	163	Hour	(b)(4)	(b)(4)	(b)(4)
(b)(4)	0002a Subject Matter Expert 1	499	Hour			
(b)(4)	0002b Subject Matter Expert 2	386	Hour			
(b)(4)	0003a Sr. Technical Reviewer 1	122	Hour			
(b)(4)	0003b Sr. Technical Reviewer 2	243	Hour			
(b)(4)	0004a Admin Support and Tech Editing 1	32	Hour			
(b)(4)	0004b Admin Support and Tech Editing 2	126	Hour			
	0006 Engineer		Hour			
	0007 Intern Level 1		Hour			
	0005a Travel	1	LOT	NTE	NTE	
	0005b G&A on Travel *	1	LOT	NTE	NTE	
TOTAL ESTIMATED PRICE FOR BASE YEAR						\$303,813.90

* G&A rate is the approved provisional/final rate identified under G.5 2052.216-71 INDIRECT COST RATES. (JAN 1993) of Contract Number 31310020D0004.

Optional Task 3						
CLIN	DESCRIPTION	EST. QTY.	UNIT	FIXED UNIT PRICE FY21 [January 28, 2021 – Sept 30, 2021]	FIXED UNIT PRICE FY22 [October 1, 2021 – March 31, 2022]	TOTAL ESTIAMTED AMOUNT (hours x blended rate)
(b)(4)	1001a Project Manager	60	Hour	(b)(4)	(b)(4)	(b)(4)
(b)(4)	2002a Subject Matter Expert 1	120	Hour			
(b)(4)	2002b Subject Matter Expert 2	120	Hour			
(b)(4)	3003a Sr. Technical Reviewer 1	20	Hour			
(b)(4)	3003b Sr. Technical Reviewer 2	100	Hour			
(b)(4)	4004a Admin Support and Tech Editing 1	12	Hour			
(b)(4)	4004b Admin Support and Tech Editing 2	48	Hour			
(b)(4)	6006 Engineer		Hour			
	7007 Intern Level 1		Hour			
TOTAL ESTIMATED PRICE FOR BASE YEAR						\$89,635.41

TOTAL ESTIMATED PRICE – BASE TASKS	\$303,813.90
TOTAL ESTIAMTED PRICE – OPTIONAL TASK 3	\$89,635.41
TOTAL ESTIMATED PRICE – INCLUSIVE OF ALL OPTIONS	\$393,449.31

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT		1. CONTRACT ID CODE		PAGE OF PAGES 1 1	
2. AMENDMENT/MODIFICATION NO. P00003		3. EFFECTIVE DATE See Block 16C		4. REQUISITION/PURCHASE REQ. NO. RES-21-0356	
6. ISSUED BY US NRC - HQ ACQUISITION MANAGEMENT DIVISION MAIL STOP TWFN-07B20M WASHINGTON DC 20555-0001		CODE NRCHQ		7. ADMINISTERED BY (If other than Item 6) CODE	
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) INFORMATION SYSTEMS LABORATORIES INC 8130 BOONE BLVD STE 500 VIENNA VA 221827745		(x)		9A. AMENDMENT OF SOLICITATION NO.	
				9B. DATED (SEE ITEM 11)	
		x		10A. MODIFICATION OF CONTRACT/ORDER NO. 31310020D0004 31310020F0096	
				10B. DATED (SEE ITEM 13) 08/03/2020	
CODE 960756138		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 amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or electronic communication which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by letter or electronic communication, provided each letter or electronic communication 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 Schedule
Net Increase: \$93,813.90

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation 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:
X	D. OTHER (Specify type of modification and authority) 52.232-22 Limitation of Funds

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.)
The purpose of this modification is to add incremental funding in the amount of \$93,813.90 thereby increasing the total obligations from \$210,000.00 to \$303,813.90.

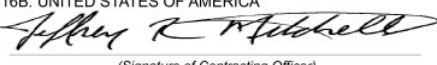
Refer to Section B.1 entitled "Consideration and Obligation-Time-And-Materials Contract" paragraph C is revised as follows:

(c) The amount presently obligated by the Government with respect to this contract is \$303,813.90.

All other terms and conditions remain unchanged.

Period of Performance: 01/28/2021 to 03/31/2022

Except as provided herein, all terms and conditions of the document referenced in Item 9 A 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) JEFFREY R. MITCHELL	
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA  (Signature of Contracting Officer)	16C. DATE SIGNED 07/28/2021

Previous edition unusable

STANDARD FORM 30 (REV. 11/2016)
Prescribed by GSA FAR (48 CFR) 53.243