ORDER FOR SUPPLIES OR SERVICES

PAGE 1 OF PAGES 34

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

1. DATE OF ORDER: 06/21/2022

2. CONTRACT NO. (If any): 31310019D0002

3. ORDER NO.: 31310022F0034

4. REQUISITION/REFERENCE NO.: See Schedule

5. ISSUING OFFICE (Address correspondence to):
US NRC - HQ
ACQUISITION MANAGEMENT DIVISION
MAIL STOP TWFN-07B20M
WASHINGTON DC 20555-0001

6. SHIP TO:
a. NAME OF CONSIGNEE: NUCLEAR REGULATORY COMMISSION
b. STREET ADDRESS: NUCLEAR REGULATORY COMMISSION
c. CITY: WASHINGTON
d. STATE: DC
e. ZIP CODE: 20555-0001

7. TO: JASON WILLIAMS
a. NAME OF CONTRACTOR: INFORMATION SYSTEMS LABORATORIES INC
b. COMPANY NAME:
c. STREET ADDRESS: 8130 BOONE BLVD STE 500
d. CITY: VIENNA
e. STATE: VA
f. ZIP CODE: 221827745

f. SH P VIA:

8. TYPE OF ORDER
☐ a. PURCHASE
REFERENCE YOUR:
Please furnish the following on the terms and conditions specified on both sides of this order and on the attached sheet, if any, including delivery as indicated.
☒ b. DELIVERY
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.

9. ACCOUNTING AND APPROPRIATION DATA: See Schedule

10. REQUISITION NG OFFICE: OFF OF NUCLEAR REG RESEARCH

11. BUS NESS CLASS FICATION (Check appropriate box(es))
☒ a. SMALL ☐ b. OTHER THAN SMALL ☐ c. DISADVANTAGED ☐ d. WOMEN-OWNED ☐ e. HUBZone
☐ f. SERVICE-DISABLED VETERAN-OWNED ☐ g. WOMEN-OWNED SMALL BUS NESS (WOSB) ELIGIBLE UNDER THE WOSB PROGRAM ☐ h. EDWOSB

12. F.O B. POINT:

13. PLACE OF
a. INSPECTION: Destination
b. ACCEPTANCE: Destination

14. GOVERNMENT B/L NO.:

15. DELIVER TO F.O B. POINT ON OR BEFORE (Date): 02/15/2024

16. DISCOUNT TERMS: 30

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)
	The Contractor shall provide services in accordance with the Statement of Work entitled, "PARCS Development of Fueled Follower Control Assembly Model for Armenia VVER-440." Continued ...					

18. SHIPPING POINT:

19. GROSS SHIPPING WEIGHT:

20. INVOICE NO.:

17(h) TOTAL (Cont. pages): $0.00

21. MAIL INVOICE TO:
a. NAME: FISCAL ACCOUNTING PROGRAM
b. STREET ADDRESS (or P.O. Box): ADMIN TRAINING GROUP AVERY STREET A3-G
BUREAU OF THE FISCAL SERVICE
PO BOX 1328
c. CITY: PARKERSBURG
d. STATE: WV
e. ZIP CODE: 26106-1328

SEE BILLING INSTRUCTIONS ON REVERSE

17(i) GRAND TOTAL: $252,158.91

22. UNITED STATES OF AMERICA BY (Signature): 06/21/2022 [redacted]

23. NAME (Typed): JENNIFER A. DUDEK
TITLE: CONTRACTING/ORDER NG OFFICER

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

DATE OF ORDER	CONTRACT NO.	ORDER NO.
06/21/2022	31310019D0002	31310022F0034

ITEM NO. (a)	SUPPLIES/SERVICES (b)	QUANTITY ORDERED (c)	UNIT (d)	UNIT PRICE (e)	AMOUNT (f)	QUANTITY ACCEPTED (g)
	The following clauses in contract no. 31310019D0002 are not applicable to this task order: 1) FAR 52.227-16 ADDITIONAL DATA REQUIREMENTS. (JUN 1987); 2) FAR 52.248-1 VALUE ENGINEERING. (OCT 2010); and 3) NRCH036 IT SECURITY REQUIREMENTS - DEVELOPMENT AND OPERATIONS AND MAINTENANCE REQUIREMENTS (APR 2014) CONTRACTOR ACCEPTANCE OF TASK ORDER: Acceptance of Task Order No. 31310022F0034 under contract No. 31310019D0002 should be made by having an official, authorized to bind your organization, execute two copies of this document in the space provided and return one copy to the Contracting Officer. You should retain the other copy for your records. Accepted Task Order No. 31310022F0034 under Contract No. 31310019D0002: _____ Signature _____ Name _____ Title _____ Date Task Order Ceiling: $252,158.91 Task Order Obligation Amount: $120,000.00 Accounting Info : Accounting Code: Continued ...					

TOTAL CARR ED FORWARD TO 1ST PAGE (ITEM 17(H)) $0.00

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

DATE OF ORDER	CONTRACT NO.	ORDER NO.
06/21/2022	31310019D0002	31310022F0034

ITEM NO. (a)	SUPPLIES/SERVICES (b)	QUANTITY ORDERED (c)	UNIT (d)	UNIT PRICE (e)	AMOUNT (f)	QUANTITY ACCEPTED (g)
	2022-X0200-REIM-60-60D003-60B301-1302-11-R-729-252A-FCA-CAMP-001-67-11-R-729-1302 Funded: $90,000.00 Accounting Code: 2022-X0200-INTLACT-7G-7GD001-1061-34-3-208-252A-34-3-208-1061 INTL Funded: $30,000.00 Period of Performance: 06/21/2022 to 02/15/2024					

TOTAL CARR ED FORWARD TO 1ST PAGE (ITEM 17(H)) $0.00

B - Supplies or Services/Prices

B.1 BRIEF PROJECT TITLE AND WORK DESCRIPTION

(a) The title of this project is: **PARCS Development of Fueled Follower Control Assembly Model for Armenia VVER-440**

(b) Summary work description:
Code Application Maintenance Program (CAMP) member Armenia has an operating VVER-440/V-270 with a fueled follower control assembly (FFCA) that is used for power-shaping during load-follow operations. In support of the Technical Support Organization (TSO) of the Armenian Nuclear Regulatory Agency (ANRA), Nuclear Radiation and Scientific Center (NRSC), the objective of this task order is to upgrade the PARCS/PATHS code to model this fueled control rod follower assembly for steady-state operation.

B.2 CONSIDERATION AND OBLIGATION-TASK ORDERS

(a) The ceiling of this order for services is **$252,158.91 (Costs of [redacted] and Fee of [redacted].**

(b) This order is subject to the minimum and maximum ordering requirements set forth in the contract.

(c) The amount presently obligated with respect to this order is **$120,000.00 (Costs of [redacted] and Fee of [redacted]).** The obligated amount shall, at no time, exceed the order ceiling as specified in paragraph (a) above. When and if the amount(s) paid and payable to the Contractor hereunder shall equal the obligated amount, the Contractor shall not be obligated to continue performance of the work unless and until the Contracting Officer shall increase the amount obligated with respect to this order, in accordance with FAR Part 43 - Modifications. Any work undertaken by the Contractor in excess of the obligated amount specified above is done so at the Contractor's sole risk and may not be reimbursed by the Government.

(d) The Contractor shall comply with the provisions of FAR 52.232-22 -Limitation of Funds, for incrementally-funded delivery orders or task orders.

B.3 PRICE/COST SCHEDULE

CLIN	Description	Amount
00001	Estimated Cost	[redacted]
00002	Fixed-Fee	[redacted]
	TOTAL	$252,158.91

C - Description/Specifications

C.1 STATEMENT OF WORK

PARCS Development of Fueled Follower Control Assembly Model for Armenia VVER-440

Contents

C.1 Background

The U.S. Nuclear Regulatory Commission (NRC), Office of Nuclear Regulatory Research (RES), Division of Safety Analysis (DSA) has responsibility for the development, testing, assessment, maintenance, and user support of the NRC's thermal-hydraulic (T/H) and neutronics computer codes (such as PARCS).

PARCS (Purdue Advanced Reactor Core Simulator) is a computer code that solves the time-dependent two-group neutron diffusion equation in three-dimensional Cartesian geometry using nodal methods to obtain the steady-state and transient neutron flux distribution. The code may be used in the analysis of reactivity-initiated accidents in light-water reactors where spatial effects may be important. It exists both as a stand-alone program and as a separate computational module coupled to other thermal-hydraulic codes. In this latter context, the source code for PARCS is tightly integrated with TRACE. PARCS may also be run in a coupled mode with RELAP5 using a looser coupling technology called the Generic Interface (GI). Associated with PARCS is the GenPMAXS code which is used for converting macroscopic cross-sections generated by lattice physics codes like SCALE/TRITON, SCALE/Polaris, CASMO, or HELIOS into a form readable by PARCS, along with a generalized capability to construct a cross section case matrix with consideration for nodal burnup history effects and nodal state parameterizations.

Armenia has an operating VVER-440/V-270 (Armenia Nuclear Power Plant, ANPP, Metsamor) with a fueled follower control assembly (FFCA) that is used for [redacted]. The Technical Support Organization (TSO) of the Armenian Nuclear Regulatory Agency (ANRA), Nuclear Radiation and Scientific Center (NRSC), as a Code Application Maintenance Program (CAMP) entity, uses PARCS/PATHS for confirmatory calculations of the

ANPP.

The FFCA is an assembly design that is unique to the VVER-440-type nuclear power plants and consists of [redacted].

PARCS/PATHS does have a mature capability to model inserted control rods (PWR control rodlets and BWR blades) during steady-state fuel cycle operation.. PARCS also has advanced weighting schemes for approximating control rod history. However, PARCS does not currently have the capability of modeling a moving control rod-with-fuel assembly, in which the total fissile loading of the core changes with the FFCA bank position change with multiple burnup increments. Currently, PARCS calculates the total core power based on the product of average power per assembly, the percentage power level, and the number of assemblies. New machinery will need to be developed to re-calculate the total core power and accumulate FFCA history [redacted] as the FFCA's are withdrawn up into the core. This model upgrade will also be useful to other CAMP member entities that regulate and analyze VVER-440s (Finland, Hungary, Ukraine, and the Czech Republic).

C.2 Objective

CAMP member Armenia has an operating VVER-440/V-270 with a fueled follower control assembly (FFCA) that is used for [redacted]. In support of the Technical Support Organization (TSO) of the Armenian Nuclear Regulatory Agency (ANRA), Nuclear Radiation and Scientific Center (NRSC), the objective of this task order is to upgrade the PARCS/PATHS code to model this fueled control rod follower assembly for steady-state operation.

C.3 Scope of Work

The main scope of work for this task order involves the upgrade of the PARCS code suite (PARCS/PATHS and/or GenPMAXS) to be able to model the fueled control rod follower assembly of the VVER-440 for core-wide static, eigenvalue calculations, quasi-steady-state burnup calculations, and for coupled (TRACE/PARCS) transient calculations: this also includes the development of pre-code planning documentation (SRS, SDID, and QTP); the vetting, analysis, and modification of current cross-section libraries; the assessment of PARCS/PATHS against operating VVER-440 data; and the development of supporting code documentation, test problems, and scripts.

SPECIFIC SUBTASKS:

3.1: Task 1 – Fueled Follower Control Assembly (FFCA) Code Development Documentation

The contractor shall draft the pre-code development documents that plan the approach to implement, document, test, and assess the FFCA capability with PARCS/PATHS/GenPMAXS, as described in NUREG-1737.

Subtask 1.1: Software Requirements Specification (SRS)
The contractor shall develop an SRS that plans for the expected changes to the underlying algorithms and requirements of the PARCS suite for the FFCA model.

Deliverable for Subtask 1.1: Software Requirements Specification (SRS)
The SRS shall be delivered within **2 months** of Subtask 1.1 commencement.

Subtask 1.2: Software Design and Implementation Document (SDID)/Qualification Test Plan (QTP) (referred to as the "test plan" in NUREG-1737)
The contractor shall develop a combined SDID/QTP document that describes the implementation of the FFCA requirements and algorithms outlined in the SRS, i.e., how the PARCS suite will be structured and designed, and also describes how the implemented FFCA capabilities are to be tested and assessed (i.e., the test problems which will be used to demonstrate the functionality and accuracy of the new FFCA model against measured VVER-440 data).

Deliverable for Subtask 1.2: Software Design and Implementation Document/Qualification Test Plan (SDID/QTP)

The SDID/QTP shall be delivered within **1 month** of Subtask 1.2 commencement.

3.2: Task 2 – Static VVER-440 Neutronics Core Analysis

Subtask 2.1: Updated Cross Section Library

The NRSC has already developed HELIOS-based cross section libraries (in PMAXS format) for the Armenian operating VVER-440 core (Cycles 18 and 20 of Metsamor). However, due to the lack of an FFCA capability within PARCS/PATHS, the NRSC [redacted] the entire FFCA [redacted] into a single PMAXS file. NRSC then developed a workaround with this [redacted] PMAXS FFCA assembly in which the [redacted]

As HELIOS is based upon 2-D transport, the contractor shall re-generate the FFCA cross sections (per axial segment) with Serpent to include 3-D effects through the introduction of axial, z-directional Assembly Discontinuity Factors (ZDFs). A separate PMAXS file shall be developed for each axial segment [redacted], and each segment shall be depleted through a proto-typical high burnup limit for an operating VVER-440. Ideally, the fuel portion of the core would be more accurately represented with a consistent set of cross section libraries that are processed with a similar case matrix and similar methods. This "stitched together" cross section library will be good enough to demonstrate the corresponding changes in PARCS functionality.

Deliverable for Subtask 2.1: Modified cross section library set for the Armenian VVER-440
The modified cross section library (NRSC 2-D HELIOS-cross sections for fuel assemblies + 3-D Serpent-based cross sections for the FFCAs) shall be delivered within **2 months** of Subtask 2.1 commencement.

Subtask 2.2: Static FFCA Geometry, Composition
The contractor shall modify PARCS/PATHS to add the FFCA associated geometry and

composition assignment. This updated code version may combine any combination of existing PARCS cards (such as: [redacted], etc.), the development of new cards, or combinations of both.

Deliverable for Subtask 2.2: Beta PARCS/PATHS distribution that can define the geometry and composition characterizing the FFCA.

This PARCS/PATHS version and supporting test problem shall be delivered within **1 month** of Subtask 2.2 commencement.

Subtask 2.3: Static FFCA Flux Calculation without Thermal Hydraulic Feedback
The contractor shall modify PARCS/PATHS to calculate static flux (core eigenvalue calculation) with inserted FFCA banks and without thermal-hydraulic feedback. This upgrade shall be able to resolve the fine mesh finite difference (FMFD) flux throughout the [redacted] regions of the FFCA and perform a control rod cusping calculation that is separate from the core nodal calculation. The FFCA cusping calculation shall also take advantage of the 3-D Serpent FFCA calculations completed in Subtask 2.1.

Deliverable for Subtask 2.3: Beta PARCS/PATHS distribution that can calculate a finite mesh finite difference (FMFD) flux throughout the newly defined geometry and composition characterizing the FFCA.

This PARCS/PATHS version and supporting test problem shall be delivered within **2 months** of Subtask 2.3 commencement.

Subtask 2.4: Staggered Channel Mesh in PATHS
The contractor shall modify PARCS/PATHS (specifically, PATHS), to accommodate the staggered axial mesh that will be obtained with partially inserted FFCA assemblies in the core. That is, as a result of FFCA movement, the axial mesh enveloping and characterizing the hydraulic losses up the FFCA will change relative to the other fuel assemblies, with possibly different momentum, pressure, and temperature distributions relative to the nominal fuel assemblies. These changes will need to be calculated to accommodate the different axial distribution of burnup, power shape, and fuel temperature of the FFCA relative to the nominal fuel assemblies.

Deliverable for Subtask 2.4: Beta PARCS/PATHS distribution with updated ability to capture different axial momentum distribution relative to nominal fuel assemblies.

This PARCS/PATHS version and supporting test problem shall be delivered within **2 months** of Subtask 2.4 commencement.

Subtask 2.5: Total Core Power Modification with Thermal-Hydraulic Feedback
The contractor shall modify PARCS/PATHS to be able to take as input (or re-formulate) a total core power density that is indicative of a core with a mixture of hexagonal fuel assemblies with FFCA assemblies being partially inserted into the bottom of the core (rather than the current assembly-average-power approach). This update shall be capable of accommodating power production in the fueled portion of the FFCA inserted into the core, and any partial power production that would occur in the FFCA below the core.

Deliverable for Subtask 2.5: Beta PARCS/PATHS distribution that can calculate this new power distribution that is based on a mixed hexagonal fuel assembly and FFCA core.

This PARCS/PATHS version and supporting test problem shall be delivered within **2 months** of Subtask 2.5 commencement.

3.3: Task 3 – VVER-440 Core Burnup

Subtask 3.1: Inter-Cycle Analysis -- FFCA Burnup

The contractor shall modify PARCS/PATHS to macroscopically deplete the FFCA component (with its own fine flux and material mesh), with the matching cross section libraries developed in Task 2.1. This FFCA depletion capability shall also be extended to the development of a new control-rod history ([redacted]) edit for the FFCA. The contractor shall develop a methodology to incorporate the FFCA burnup onto the PARCS/PATHS core-wise burnup calculation (i.e., by averaging, mapping, or combining the mesh differences between the FFCA and the other nodes).

Deliverable for Subtask 3.1: Beta PARCS/PATHS distribution that can calculate the FFCA and core-wise burnup throughout one cycle.

This PARCS/PATHS version and supporting test problem shall be delivered within **2 months** of Subtask 3.1 commencement.

Subtask 3.2: Intra-Cycle Analysis -- Cycle-to-Cycle Burnup

The contractor shall modify PARCS/PATHS (cards within the [redacted] block and any other supporting blocks and cards) to support fuel shuffle and cycle-to-cycle depletion with FFCA's. As part of this task the contractor shall develop a mechanism to store the necessary "history" and burnup information (FFCA radial and axial position [step insertion], FFCA burnup, FFCA control history, and any other supporting thermal-hydraulic, flux, and power edits into some combination of restart and exposure file ([redacted]), and PARCS/PATHS shall be able to read-in this information with a fuel shuffling scheme.

Deliverable for Subtask 3.2: Beta PARCS/PATHS distribution that can shuffle the FFCA and regular fuel assemblies from cycle-to-cycle, along with any other supporting variables and edits.

This PARCS/PATHS version and supporting test problem shall be delivered within **2 months** of Subtask 3.2 commencement.

4.4: Task 4 – Final PARCS/PATHS Distribution and Completion Report

Subtask 4.1: Final PARCS/PATHS Distribution

The contractor shall provide the final PARCS/PATHS (and GenPMAXS) distribution(s) that encompasses all of the cumulative source code changes outlined in Subtasks 2.2, 2.3, 2.4, 2.5, 3.1, and 3.2, along with the supporting test problems that demonstrate the added capabilities.

The relevant LaTeX(lua)/python-based documentation of the final PARCS/PATHS version shall also be updated to reflect the added capabilities (at a minimum, the PARCS Theory and PARCS

User Manuals, and the other manuals as needed). The PARCS/PATHS change summary file (in HyperText Markup Language, HTML) shall also be updated to reflect all of the source code changes submitted with the code check-in (code added and deleted, verbal summaries of code changes, and changes to the code documentation).

In addition, test problems demonstrating the FFCA capability shall be added to the regression suite, and python scripts that illustrate comparisons of PARCS/PATHS detector responses to ANPP measurements shall also be included.

Deliverable for Subtask 4.1: Final PARCS/PATHS distribution that can fulfill all of the requirements of VVER-440/V-270 core analysis with inserted FFCAs from cycle-to-cycle.

This PARCS/PATHS version and supporting test problem(s) shall be delivered within **1 month** of Subtask 4.1 commencement.

Subtask 4.2: Prepare Completion Report
The contractor shall prepare a Completion Report (CR) that documents the entire development effort. Specifically, the report shall summarize the methodology and user input changes, and shall include calculation results that demonstrate the capability of the changed coding. These calculation results shall include some representative axial and radial power shape changes with burnup and comparisons of PARCS/PATHS detector response calculations to measurements taken from the ANPP.

Deliverable for Subtask 4.2: Final Completion Report documenting the entire effort.

The Completion Report shall be delivered within **2 months** of Subtask 4.2 commencement.

C.4 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 activities and producing deliverables. The report shall include order summary information, work completed during the specified period, milestone schedule information, problem resolution, travel plans, and staff hour summary.

C.5 Deliverables and Delivery Schedule

The Contractor shall correct errors in contractor developed software and applicable documentation that are not commercial off-the-shelf which are discovered by the NRC or the contractor. Inability of the parties to determine the cause of software errors shall be resolved in accordance with the Disputes clause in Section I, FAR 52.233-1, incorporated by reference in the base contract.

Section/Task No.	Deliverable	Due Date	Format	Due To

1.1	SRS	Within 2 months of 1.1 Start	MS Word Document	CO/COR
1.2	SDID/QTP	Within 1 month of 1.2 Start	MS Word Document	CO/COR
2.1	3-D Serpent Cross Section Libraries for FFCAs	Within 2 months of 2.1 Start	-Raw Serpent Libraries -GenPMAXS inputs and scripts -PMAXS files	CO/COR
2.2	PARCS/PATHS beta version to Calculate Geometry/Composition	Within 1 month of 2.2 Start	Tarball or SecureZIP Archive	CO/COR
2.3	PARCS/PATHS beta version to Calculate StaticFFCA Flux Calculation	Within 2 months of 2.3 Start	Tarball or SecureZIP Archive	CO/COR
2.4	PARCS/PATHS beta version to Calculate Staggered Channel Mesh	Within 2 months of 2.4 Start	Tarball or SecureZIP Archive	CO/COR
2.5	PARCS/PATHS beta version to Calculate Total Core Power with T-H Feedback	Within 2 months of 2.5 Start	Tarball or SecureZIP Archive	CO/COR
3.1	PARCS/PATHS beta version to Calculate Cycle Burnup	Within 2 months of 3.1 Start	Tarball or SecureZIP Archive	CO/COR
3.2	PARCS/PATHS beta version to Calculate Cycle-to-Cycle Burnup	Within 2 months of 3.2 Start	Tarball or SecureZIP Archive	CO/COR
4.1	Final PARCS/PATHS Distribution	Within 1 month of 4.1 Start	Tarball or SecureZIP Archive	CO/COR
4.2	Completion Report	Within 2 months of 4.2 Start	MS Word Document	CO/COR
C.4	MLSR -1 Monthly Report	20th of the following month	MS Word Document	CO/COR

C.6 Required Labor Categories

Required Labor Categories

Labor Category	Minimum Qualification Requirement
Principal Engineer	Completion of graduate level courses in numerical methods, neutronic methods, reactor physics, and thermal-hydraulics Knowledge of core nuclear analysis algorithms and application; nuclear analysis methods development; numerical algorithms for the solution of systems of equations; and the numerical methods and algorithms which make up PARCS Knowledge of FORTRAN, DOS, and Linux; knowledge of software engineering and software quality assurance (SQA) Knowledge of using LaTeX (lualatex)/python to maintain PARCS documentation
Engineer	Completion of graduate level courses in numerical methods, neutronic methods, reactor physics, and thermal-hydraulics Knowledge of core nuclear analysis algorithms and application; nuclear analysis methods development; numerical algorithms for the solution of systems of equations; and the numerical methods and algorithms which make up PARCS Knowledge of the PARCS/PATHS source code and the GenPMAXS source code Knowledge of nuclear analysis code structure, algorithms, and code compilation/build systems Experience in coding with modern FORTRAN standards and in working with DOS, Linux, UNIX, and scripting languages such as Perl and Python; experience in software engineering and software quality assurance (SQA) Experience with the following lattice physics packages: HELIOS, CASMO, SCALE/TRITON, SCALE/Polaris, SCALE/Shift, and Serpent Knowledge of using LaTeX (lualatex)/python to maintain PARCS documentation Experience performing quasi-steady state, fuel cycle

	calculations with PARCS/PATHS Experience in adding advanced fuel thermo-mechanical capabilities to PARCS/PATHS Experience in mounting PARCS onto a version control system (such as CVS and SVN) and making changes and modifications to the version control system Experience developing and maintaining python scripts to compare PARCS/PATHS versions to measured detector power responses as part of PARCS/PATHS assessment Experience in developing/maintaining bash scripts to regression test PARCS/PATHS versions Experience in developing TRACE updates for changes to PARCS source Experience in developing input decks to test PARCS/PATHS features

C.7 Applicable Documents and Standards

The contractor shall comply with the following applicable regulations, publications, manuals, and local policies and procedures:

· 41 USC § 2302(b)(2)
· NUREG-1737 - Software Quality Assurance Procedures for NRC Thermal Hydraulic Codes

C.8 Section 508 – Information and Communication Technology Accessibility

N/A

C.9 Incremental Development for Software

The Contractor shall use an incremental build model for software development. The Agency defines an incremental build model as a method of software development where the product is designed, implemented, and tested incrementally, with increasing functionality and/or capability added in each increment until the product is finished.

C.10 Place of Performance

The work to be performed under this contract shall be primarily performed at the contractor’s

site.

C.11 Contractor Travel

None

C.12 Security Requirements

The following regulations/requirements are applicable to this task order:

1. NRC MD 12.6 - NRC Controlled Unclassified Information (CUI) Program, IT Level II clearance

2. All work under this task order and all devices used to process NRC sensitive information shall comply with the National Institute of Standards and Technology (NIST), Special Publication (SP) 800-171r2, “Protecting Controlled Unclassified Information in Nonfederal Information Systems and Organizations,” and NRC guidance for the identification and documentation of minimum security controls. Upon request, the contractor shall participate with the NRC to review the contractor’s compliance with NIST 800-171r2 (i.e., provide requested documentation, participate in meetings, etc.).

3. The contractor shall ensure that the software does not contain undocumented functions and undocumented methods for gaining access to the software or to the computer system on which it is installed. This includes, but is not limited to, master access keys, back doors, or trapdoors.

C.13 License Fee Recoverable

All the tasks listed in this SOW are NOT license fee recoverable.

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: N/A.

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 31310019D0002 / 31310022F0034.

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:

a. Contracting Officer Representative:
Refer to Section H.7 2052.215-71 CONTRACTING OFFICER REPRESENTATIVE AUTHORITY

b. Contracting Officer (CO) (1 electronic copy)

(End of Clause)

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

This order shall commence on Date of Award and will expire on 02/15/2024.

G - Contract Administration Data

NRC Local Clauses Incorporated by Full Text

G.1 ELECTRONIC PAYMENTS (DEC 2017) – ALTERNATE 1

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 on the payee’s letterhead, invoice, or on the Government’s Standard Form 1034, “Public Voucher for Purchases and Services Other than Personal,” and Standard Form 1035, “Public Voucher for Purchases Other than Personal – Continuation Sheet.” The preferred method of submitting invoices is electronically to: NRC@fiscal.treasury.gov .

H - Special Contract Requirements

NRC Local Clauses Incorporated by Full Text

H.1 SECURITY REQUIREMENTS FOR INFORMATION TECHNOLOGY LEVEL I OR LEVEL II ACCESS APPROVAL (JUL 2016)

The contractor must identify all individuals selected to work under this contract. The NRC Contracting Officer's Representative (COR) shall make the final determination of the level, if any, of IT access approval required for all individuals working under this contract/order using the following guidance. The Government shall have full and complete control and discretion over granting, denying, withholding, or terminating IT access approvals for contractor personnel performing work under this contract/order.

The contractor shall conduct a preliminary security interview or review for each employee requiring IT level I or II access and submit to the Government only the names of candidates that have a reasonable probability of obtaining the level of IT access approval for which the employee has been proposed. The contractor shall pre-screen its applicants for the following:

(a) felony arrest in the last seven (7) years; (b) alcohol related arrest within the last five (5) years; (c) record of any military courts-martial convictions in the past ten (10) years; (d) illegal use of narcotics or other controlled substances possession in the past year, or illegal purchase, production, transfer, or distribution of narcotics or other controlled substances in the last seven (7) years; and (e) delinquency on any federal debts or bankruptcy in the last seven (7) years.

The contractor shall make a written record of its pre-screening interview or review (including any information to mitigate the responses to items listed in (a) - (e)), and have the employee verify the pre-screening record or review, sign and date it. The contractor shall supply two (2) copies of the signed contractor's pre-screening record or review to the NRC Contracting Officer's Representative (COR), who will then provide them to the NRC Office of Administration, Division of Facilities and Security, Personnel Security Branch with the employee's completed IT access application package.

The contractor shall further ensure that its personnel complete all IT access approval security applications required by this clause within fourteen (14) calendar days of notification by the NRC Contracting Officer's Representative (COR) of initiation of the application process. Timely receipt of properly completed records of the pre-screening record and IT access approval applications (submitted for candidates that have a reasonable probability of obtaining the level of security assurance necessary for access to NRC's IT systems/data) is a requirement of this contract/order. Failure of the contractor to comply with this requirement may be a basis to terminate the contract/order for cause, or to offset from the contract's invoiced cost or price the NRC's incurred costs or delays as a result of inadequate pre-screening by the contractor.

SECURITY REQUIREMENTS FOR IT LEVEL I

Performance under this contract/order will involve contractor personnel who perform services requiring direct access to or operation of agency sensitive information technology systems or data (IT Level I). The IT Level I involves responsibility for: (a) the planning, direction, and implementation of a computer security program; (b) major responsibility for the direction, planning, and design of a computer system, including hardware and software; (c) the capability to access a computer system during its operation or maintenance in such a way that could

cause or that has a relatively high risk of causing grave damage; or (d) the capability to realize a significant personal gain from computer access.

Contractor personnel shall not have access to sensitive information technology systems or data until they are approved by DFS/PSB and they have been so informed in writing by the NRC Contracting Officer's Representative (COR). Temporary IT access may be approved by DFS/PSB based on a favorable review or adjudication of their security forms and checks. Final IT access may be approved by DFS/PSB based on a favorably review or adjudication of a completed background investigation. However, temporary access authorization approval will be revoked and the employee may subsequently be denied IT access in the event the employee's investigation cannot be favorably adjudicated. Such an employee will not be authorized to work under any NRC contract/order requiring IT access without the approval of DFS/PSB, as communicated in writing to the contractor by the NRC Contracting Officer's Representative (COR). Where temporary access authorization has been revoked or denied by DFS/PSB, the contractor shall assign another contractor employee to perform the necessary work under this contract/order without delay to the contract/order performance schedule, or without adverse impact to any other terms or conditions of the contract/order. When an individual receives final IT access approval from DFS/PSB, the individual will be subject to a reinvestigation every ten (10) years thereafter (assuming continuous performance under contracts/orders at NRC) or more frequently in the event of noncontinuous performance under contracts/orders at NRC.

CORs are responsible for submitting the completed access/clearance request package as well as other documentation that is necessary to DFS/PSB. The contractor shall submit a completed security forms packet, including the OPM Standard Form (SF) 86 (online Questionnaire for National Security Positions), two (2) copies of the Contractor's signed pre-screening record, and two (2) FD 258 fingerprint charts, to DFS/PSB for review and adjudication, prior to the individual being authorized to perform work under this contract/order requiring access to sensitive information technology systems or data. Non-U.S. citizens must provide official documentation to the DFS/PSB, as proof of their legal residency. This documentation can be a Permanent Resident Card, Temporary Work Visa, Employment Authorization Card, or other official documentation issued by the U.S. Citizenship and Immigration Services. Any applicant with less than seven (7) years residency in the U.S. will not be approved for IT Level I access. The Contractor shall submit the documents to the NRC Contracting Officer's Representative (COR) who will give them to DFS/PSB. The contractor shall ensure that all forms are accurate, complete, and legible. Based on DFS/PSB review of the contractor employee's security forms and/or the receipt of adverse information by NRC, the contractor individual may be denied access to NRC facilities and sensitive information technology systems or data until a final determination is made by DFS/PSB. The contractor individual's clearance status will thereafter be communicated to the contractor by the NRC Contracting Officer's Representative (COR) regarding the contractor person's eligibility.

In accordance with NRCAR 2052.204-70 "Security," IT Level I contractors shall be subject to the attached NRC Form 187 and SF-86. Together, these furnish the basis for providing security requirements to contractors that have or may have an NRC contractual relationship which requires access to or operation of agency sensitive information technology systems, remote development and/or analysis of sensitive information technology systems or data, or other access to such systems and data; access on a continuing basis (in excess more than 30 calendar days) to NRC buildings; or otherwise requires issuance of an unescorted NRC badge.

SECURITY REQUIREMENTS FOR IT LEVEL II

Performance under this contract/order will involve contractor personnel that develop and/or analyze sensitive information technology systems or data or otherwise have access to such systems or data (IT Level II).

The IT Level II involves responsibility for the planning, design, operation, or maintenance of a computer system and all other computer or IT positions.

Contractor personnel shall not have access to sensitive information technology systems or data until they are approved by DFS/PSB and they have been so informed in writing by the NRC Contracting Officer's Representative (COR). Temporary access may be approved by DFS/PSB based on a favorable review of their security forms and checks. Final IT access may be approved by DFS/PSB based on a favorably adjudication. However, temporary access authorization approval will be revoked and the contractor employee may subsequently be denied IT access in the event the employee's investigation cannot be favorably adjudicated. Such an employee will not be authorized to work under any NRC contract/order requiring IT access without the approval of DFS/PSB, as communicated in writing to the contractor by the NRC Contracting Officer's Representative (COR). Where temporary access authorization has been revoked or denied by DFS/PSB, the contractor is responsible for assigning another contractor employee to perform the necessary work under this contract/order without delay to the contract/order performance schedule, or without adverse impact to any other terms or conditions of the contract/order. When a contractor employee receives final IT access approval from DFS/PSB, the individual will be subject to a review or reinvestigation every ten (10) years (assuming continuous performance under contract/order at NRC) or more frequently in the event of noncontinuous performance under contract/order at NRC.

CORs are responsible for submitting the completed access/clearance request package as well as other documentation that is necessary to DFS/PSB. The contractor shall submit a completed security forms packet, including the OPM Standard Form (SF) 86 (online Questionnaire for National Security Positions), two (2) copies of the Contractor's signed pre-screening record and two (2) FD 258 fingerprint charts, to DFS/PSB for review and adjudication, prior to the contractor employee being authorized to perform work under this contract/order. Non-U.S. citizens must provide official documentation to the DFS/PSB, as proof of their legal residency. This documentation can be a Permanent Resident Card, Temporary Work Visa, Employment Authorization Card, or other official documentation issued by the U.S. Citizenship and Immigration Services. Any applicant with less than seven (7) years residency in the U.S. will not be approved for IT Level II access. The Contractor shall submit the documents to the NRC Contracting Officer's Representative (COR) who will give them to DFS/PSB. The contractor shall ensure that all forms are accurate, complete, and legible. Based on DFS/PSB review of the contractor employee's security forms and/or the receipt of adverse information by NRC, the contractor employee may be denied access to NRC facilities, sensitive information technology systems or data until a final determination is made by DFS/PSB regarding the contractor person's eligibility.

In accordance with NRCAR 2052.204-70 "Security," IT Level II contractors shall be subject to the attached NRC Form 187, SF-86, and contractor's record of the pre-screening. Together, these furnish the basis for providing security requirements to contractors that have or may have an NRC contractual relationship which requires access to or operation of agency sensitive information technology systems, remote development and/or analysis of sensitive information technology systems or data, or other access to such systems or data; access on a continuing

basis (in excess of more than 30 calendar days) to NRC buildings; or otherwise requires issuance of an unescorted NRC badge.

CANCELLATION OR TERMINATION OF IT ACCESS/REQUEST

When a request for IT access is to be withdrawn or canceled, the contractor shall immediately notify the NRC Contracting Officer's Representative (COR) by telephone so that the access review may be promptly discontinued. The notification shall contain the full name of the contractor employee and the date of the request. Telephone notifications must be promptly confirmed by the contractor in writing to the NRC Contracting Officer's Representative (COR), who will forward the confirmation to DFS/PSB. Additionally, the contractor shall immediately notify the NRC Contracting Officer's Representative (COR) in writing, who will in turn notify DFS/PSB, when a contractor employee no longer requires access to NRC sensitive automated information technology systems or data, including the voluntary or involuntary separation of employment of a contractor employee who has been approved for or is being processed for IT access.

The contractor shall flow the requirements of this clause down into all subcontracts and agreements with consultants for work that requires them to access NRC IT resources.

H.2 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.3 DRUG FREE WORKPLACE TESTING: UNESCORTED ACCESS TO NUCLEAR FACILITIES, ACCESS TO CLASSIFIED INFORMATION OR SAFEGUARDS INFORMATION, OR PERFORMING IN SPECIALLY SENSITIVE POSITIONS (MARCH 2019)

The following Contractor employees, subcontractor personnel, and consultants proposed for performance or performing under this contract shall be subject to pre-assignment, random, reasonable suspicion, and post-accident drug testing: (1) individuals who have access to

classified information (National Security Information and/or Restricted Data); (2) individuals who have access to Safeguards information (section 147 of the Atomic Energy Act of 1954, as amended); (3) individuals who are authorized to carry firearms while performing work under this contract; (4) individuals who are required to operate government vehicles or transport passengers for the NRC; (5) individuals who are required to operate hazardous equipment at NRC facilities; (6) individuals who administer the agency's drug program or who have Employee Assistance Program duties; (7) individuals who have unescorted access to vital or protected areas of Nuclear Power Plants, Category 1 Fuel Cycle Facilities, or Uranium Enrichment Facilities; or (8) incident/emergency response personnel (including on-call).

H.4 KEY PERSONNEL. (JAN 1993)

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

1) Project Manager: [redacted]; 2) Principal Engineer: [redacted]; and 3) Engineers: [redacted]

*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.

NRCAR Clauses Incorporated By Full Text

H.5 2052.204-70 SECURITY. (OCT 1999)

(a) Security/Classification Requirements Form. The attached NRC Form 187 (See List of Attachments) furnishes the basis for providing security and classification requirements to prime contractors, subcontractors, or others (e.g., bidders) who have or may have an

NRC contractual relationship that requires access to classified information or matter, access on a continuing basis (in excess of 90 or more days) to NRC Headquarters controlled buildings, or otherwise requires NRC photo identification or card-key badges.

(b) It is the contractor's duty to safeguard National Security Information, Restricted Data, and Formerly Restricted Data. The contractor shall, in accordance with the Commission's security regulations and requirements, be responsible for safeguarding National Security Information, Restricted Data, and Formerly Restricted Data, and for protecting against sabotage, espionage, loss, and theft, the classified documents and material in the contractor's possession in connection with the performance of work under this contract. Except as otherwise expressly provided in this contract, the contractor shall transmit to the Commission any classified matter in the possession of the contractor or any person under the contractor's control in connection with performance of this contract upon completion or termination of this contract.

(1) The contractor shall complete a certificate of possession to be furnished to the Commission specifying the classified matter to be retained if the retention is:

(i) Required after the completion or termination of the contract; and

(ii) Approved by the contracting officer.

(2) The certification must identify the items and types or categories of matter retained, the conditions governing the retention of the matter and their period of retention, if known. If the retention is approved by the contracting officer, the security provisions of the contract continue to be applicable to the matter retained.

(c) In connection with the performance of the work under this contract, the contractor may be furnished, or may develop or acquire, proprietary data (trade secrets) or confidential or privileged technical, business, or financial information, including Commission plans, policies, reports, financial plans, internal data protected by the Privacy Act of 1974 (Pub. L. 93-579), or other information which has not been released to the public or has been determined by the Commission to be otherwise exempt from disclosure to the public. The contractor agrees to hold the information in confidence and not to directly or indirectly duplicate, disseminate, or disclose the information, in whole or in part, to any other person or organization except as necessary to perform the work under this contract. The contractor agrees to return the information to the Commission or otherwise dispose of it at the direction of the contracting officer. Failure to comply with this clause is grounds for termination of this contract.

(d) Regulations. The contractor agrees to conform to all security regulations and requirements of the Commission which are subject to change as directed by the NRC Division of Facilities and Security and the Contracting Officer. These changes will be under the authority of the FAR Changes clause referenced in Section I of this document.

(e) Definition of National Security Information. As used in this clause, the term National Security Information means information that has been determined pursuant to Executive Order 12958 or any predecessor order to require protection against unauthorized disclosure and that is so designated.

(f) Definition of Restricted Data. As used in this clause, the term Restricted Data means all data concerning design, manufacture, or utilization of atomic weapons; the production of special nuclear material; or the use of special nuclear material in the production of energy, but does not include data declassified or removed from the Restricted Data category under to Section 142 of the Atomic Energy Act of 1954, as amended.

(g) Definition of Formerly Restricted Data. As used in this clause the term Formerly Restricted Data means all data removed from the Restricted Data category under Section 142-d of the Atomic Energy Act of 1954, as amended.

(h) Security clearance personnel. The contractor may not permit any individual to have access to Restricted Data, Formerly Restricted Data, or other classified information, except in accordance with the Atomic Energy Act of 1954, as amended, and the Commission's regulations or requirements applicable to the particular type or category of classified information to which access is required. The contractor shall also execute a Standard Form 312, Classified Information Nondisclosure Agreement, when access to classified information is required.

(i) Criminal liabilities. Disclosure of National Security Information, Restricted Data, and Formerly Restricted Data relating to the work or services ordered hereunder to any person not entitled to receive it, or failure to safeguard any Restricted Data, Formerly Restricted Data, or any other classified matter that may come to the contractor or any person under the contractor's control in connection with work under this contract, may subject the contractor, its agents, employees, or subcontractors to criminal liability under the laws of the United States. (See the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq.; 18 U.S.C. 793 and 794; and Executive Order 12958.)

(j) Subcontracts and purchase orders. Except as otherwise authorized, in writing, by the contracting officer, the contractor shall insert provisions similar to the foregoing in all subcontracts and purchase orders under this contract.

(k) In performing contract work, the contractor shall classify all documents, material, and equipment originated or generated by the contractor in accordance with guidance issued by the Commission. Every subcontract and purchase order issued under the contract that involves originating or generating classified documents, material, and equipment must provide that the subcontractor or supplier assign the proper classification to all documents, material, and equipment in accordance with guidance furnished by the contractor.

(End of Clause)

H.6 2052.209-72 CONTRACTOR ORGANIZATIONAL CONFLICTS OF INTEREST. (JAN 1993)

(a) Purpose. The primary purpose of this clause is to aid in ensuring that the contractor:

(1) Is not placed in a conflicting role because of current or planned interests (financial, contractual, organizational, or otherwise) which relate to the work under this contract; and

(2) Does not obtain an unfair competitive advantage over other parties by virtue of its performance of this contract.

(b) Scope. The restrictions described apply to performance or participation by the contractor, as defined in 48 CFR 2009.570-2 in the activities covered by this clause.

(c) Work for others.

(1) Notwithstanding any other provision of this contract, during the term of this contract, the contractor agrees to forego entering into consulting or other contractual arrangements with any firm or organization the result of which may give rise to a conflict of interest with respect to the work being performed under this contract. The contractor shall ensure that all employees under this contract abide by the provision of this clause. If the contractor has reason to believe, with respect to itself or any employee, that any proposed consultant or other contractual arrangement with any firm or organization may involve a potential conflict of interest, the contractor shall obtain the written approval of the contracting officer before the execution of such contractual arrangement.

(2) The contractor may not represent, assist, or otherwise support an NRC licensee or applicant undergoing an NRC audit, inspection, or review where the activities that are the subject of the audit, inspection, or review are the same as or substantially similar to the services within the scope of this contract (or task order as appropriate) except where the NRC licensee or applicant requires the contractor's support to explain or defend the contractor's prior work for the utility or other entity which NRC questions.

(3) When the contractor performs work for the NRC under this contract at any NRC licensee or applicant site, the contractor shall neither solicit nor perform work in the same or similar technical area for that licensee or applicant organization for a period commencing with the award of the task order or beginning of work on the site (if not a task order contract) and ending one year after completion of all work under the associated task order, or last time at the site (if not a task order contract).

(4) When the contractor performs work for the NRC under this contract at any NRC licensee or applicant site,

(i) The contractor may not solicit work at that site for that licensee or applicant during the period of performance of the task order or the contract, as appropriate.

(ii) The contractor may not perform work at that site for that licensee or applicant during the period of performance of the task order or the contract, as appropriate, and for one year thereafter.

(iii) Notwithstanding the foregoing, the contracting officer may authorize the contractor to solicit or perform this type of work (except work in the same or similar technical area) if the contracting officer determines that the situation will not pose a potential for technical bias or unfair competitive advantage.

(d) Disclosure after award.

(1) The contractor warrants that to the best of its knowledge and belief, and except as otherwise set forth in this contract, that it does not have any organizational conflicts of interest as defined in 48 CFR 2009.570-2.

(2) The contractor agrees that if, after award, it discovers organizational conflicts of interest with respect to this contract, it shall make an immediate and full disclosure in writing to the contracting officer. This statement must include a description of the action which the contractor has taken or proposes to take to avoid or mitigate such conflicts. The NRC may, however, terminate the contract if termination is in the best interest of the Government.

(3) It is recognized that the scope of work of a task-order-type contract necessarily encompasses a broad spectrum of activities. Consequently, if this is a task-order-type contract, the contractor agrees that it will disclose all proposed new work involving NRC licensees or applicants which comes within the scope of work of the underlying contract. Further, if this contract involves work at a licensee or applicant site, the contractor agrees to exercise diligence to discover and disclose any new work at that licensee or applicant site. This disclosure must be made before the submission of a bid or proposal to the utility or other regulated entity and must be received by the NRC at least 15 days before the proposed award date in any event, unless a written justification demonstrating urgency and due diligence to discover and disclose is provided by the contractor and approved by the contracting officer. The disclosure must include the statement of work, the dollar value of the proposed contract, and any other documents that are needed to fully describe the proposed work for the regulated utility or other regulated entity. NRC may deny approval of the disclosed work only when the NRC has issued a task order which includes the technical area and, if site-specific, the site, or has plans to issue a task order which includes the technical area and, if site-specific, the site, or when the work violates paragraphs (c)(2), (c)(3) or (c)(4) of this section.

(e) Access to and use of information.

(1) If, in the performance of this contract, the contractor obtains access to information, such as NRC plans, policies, reports, studies, financial plans, internal data protected by the Privacy Act of 1974 (5 U.S.C. Section 552a (1988)), or the Freedom of Information Act (5 U.S.C. Section 552 (1986)), the contractor agrees not to:

(i) Use this information for any private purpose until the information has been released to the public;

(ii) Compete for work for the Commission based on the information for a period of six months after either the completion of this contract or the release of the information to the public, whichever is first;

(iii) Submit an unsolicited proposal to the Government based on the information until one year after the release of the information to the public; or

(iv) Release the information without prior written approval by the contracting officer unless the information has previously been released to the public by the NRC.

(2) In addition, the contractor agrees that, to the extent it receives or is given access to proprietary data, data protected by the Privacy Act of 1974 (5 U.S.C. Section 552a (1988)), or the Freedom of Information Act (5 U.S.C. Section 552 (1986)), or other confidential or privileged technical, business, or financial information under this contract, the contractor shall treat the information in accordance with restrictions placed on use of the information.

(3) Subject to patent and security provisions of this contract, the contractor shall have the right to use technical data it produces under this contract for private purposes provided that all requirements of this contract have been met.

(f) Subcontracts. Except as provided in 48 CFR 2009.570-2, the contractor shall include this clause, including this paragraph, in subcontracts of any tier. The terms contract, contractor, and contracting officer, must be appropriately modified to preserve the Government's rights.

(g) Remedies. For breach of any of the above restrictions, or for intentional nondisclosure or misrepresentation of any relevant interest required to be disclosed concerning this contract or for such erroneous representations that necessarily imply bad faith, the Government may terminate the contract for default, disqualify the contractor from subsequent contractual efforts, and pursue other remedies permitted by law or this contract.

(h) Waiver. A request for waiver under this clause must be directed in writing to the contracting officer in accordance with the procedures outlined in 48 CFR 2009.570-9.

(i) Follow-on effort. The contractor shall be ineligible to participate in NRC contracts, subcontracts, or proposals therefor (solicited or unsolicited) which stem directly from the contractor's performance of work under this contract. Furthermore, unless so directed in writing by the contracting officer, the contractor may not perform any technical consulting or management support services work or evaluation activities under this contract on any of its products or services or the products or services of another firm if the contractor has been substantially involved in the development or marketing of the products or services.

(1) If the contractor under this contract, prepares a complete or essentially complete statement of work or specifications, the contractor is not eligible to perform or participate in the initial contractual effort which is based on the statement of work or specifications. The contractor may not incorporate its products or services in the statement of work or specifications unless so directed in writing by the contracting officer, in which case the restrictions in this paragraph do not apply.

(2) Nothing in this paragraph precludes the contractor from offering or selling its standard commercial items to the Government.

(End of Clause)

H.7 2052.215-71 CONTRACTING OFFICER REPRESENTATIVE AUTHORITY. (OCT 1999)

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

Name: Nathanael Hudson
Address: U.S. Nuclear Regulatory Commission
Office of Nuclear Regulatory Research
Washington, DC 20555
Phone: 301-415-2182
E-mail: Nathanael.Hudson@nrc.gov

Alternate COR:

Name: Christopher Murray
Address: U.S. Nuclear Regulatory Commission
Office of Nuclear Regulatory Research
Washington, DC 20555
Phone: 301-415-2349
E-mail: Christopher.Murray@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 (SOW) or changes to specific travel identified in the SOW), fills in details, or otherwise serves to accomplish the contractual SOW.

(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, approval of 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 COR 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 COR 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 as 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 the 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 thereto is subject to 52.233-1 - Disputes.

(i) In addition to providing technical direction as defined in paragraph (b) of the section, the COR 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.

(4) Assist the contractor in obtaining the badges for the contractor personnel.

(5) Immediately notify the Security Branch, Division of Facilities and Security (SB/DFS) (via e-mail) when a contractor employee no longer requires access authorization and return of any NRC issued badge to SB/DFS within three days after their termination.

(6) Ensure that all contractor employees that require access to classified Restricted Data or National Security Information or matter, access to sensitive unclassified information (Safeguards, Official Use Only, and Proprietary information) access to sensitive IT systems or data, unescorted access to NRC controlled buildings/space, or unescorted access to protected and vital areas of nuclear power plants receive approval of SB/DFS prior to access in accordance with Management Directive and Handbook 12.3.

(7) For contracts for the design, development, maintenance or operation of Privacy Act Systems of Records, obtain from the contractor as part of closeout procedures, written certification that the contractor has returned to NRC, transferred to the successor contractor, or destroyed at the end of the contract in accordance with instructions provided by the NRC Systems Manager for Privacy Act Systems of Records, all records (electronic or paper) which were created, compiled, obtained or maintained under the contract.

(End of Clause)

I - Contract Clauses

FAR Clauses Incorporated By Full Text

I.1 52.227-17 RIGHTS IN DATA--SPECIAL WORKS. (DEC 2007)

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

Data means recorded information, regardless of form or the media on which it may be recorded. The term includes technical data and computer software. The term does not include information incidental to contract administration, such as financial, administrative, cost or pricing, or management information.

Unlimited rights means the rights of the Government to use, disclose, reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, in any manner and for any purpose, and to have or permit others to do so.

(b) Allocation of Rights. (1) The Government shall have--

(i) Unlimited rights in all data delivered under this contract, and in all data first produced in the performance of this contract, except as provided in paragraph (c) of this clause.

(ii) The right to limit assertion of copyright in data first produced in the performance of this contract, and to obtain assignment of copyright in that data, in accordance with paragraph (c)(1) of this clause.

(iii) The right to limit the release and use of certain data in accordance with paragraph (d) of this clause.

(2) The Contractor shall have, to the extent permission is granted in accordance with paragraph (c)(1) of this clause, the right to assert claim to copyright subsisting in data first produced in the performance of this contract.

(c) Copyright--(1) Data first produced in the performance of this contract. (i) The Contractor shall not assert or authorize others to assert any claim to copyright subsisting in any data first produced in the performance of this contract without prior written permission of the Contracting Officer. When copyright is asserted, the Contractor shall affix the appropriate copyright notice of 17 U.S.C. 401 or 402 and acknowledgment of Government sponsorship (including contract number) to the data when delivered to the Government, as well as when the data are published or deposited for registration as a published work in the U.S. Copyright Office. The Contractor grants to the Government, and others acting on its behalf, a paid-up, nonexclusive, irrevocable, worldwide license for all delivered data to reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, by or on behalf of the Government.

(ii) If the Government desires to obtain copyright in data first produced in the performance of this contract and permission has not been granted as set forth in paragraph (c)(1)(i) of this clause, the Contracting Officer shall direct the Contractor to assign (with or without registration), or obtain the

assignment of, the copyright to the Government or its designated assignee.

(2) Data not first produced in the performance of this contract. The Contractor shall not, without prior written permission of the Contracting Officer, incorporate in data delivered under this contract any data not first produced in the performance of this contract and that contain the copyright notice of 17 U.S.C. 401 or 402, unless the Contractor identifies such data and grants to the Government, or acquires on its behalf, a license of the same scope as set forth in paragraph (c)(1) of this clause.

(d) Release and use restrictions. Except as otherwise specifically provided for in this contract, the Contractor shall not use, release, reproduce, distribute, or publish any data first produced in the performance of this contract, nor authorize others to do so, without written permission of the Contracting Officer.

(e) Removed.

(End of clause)

J - List of Documents, Exhibits and Other Attachments

Attachment Number	Title	Document Version	Date	Number of Pages
1	Attachment No. 1: NRC Form 187 – CONTRACT SECURITY AND/OR CLASSIFICATION REQUIREMENTS	BASE	05/02/2022	4