ORDER FOR SUPPLIES OR SERVICES

PAGE 1 OF PAGES 20

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

1. DATE OF ORDER: 09/14/2017

2. CONTRACT NO. *(If any)*: NRC-HQ-60-14-E-0002

3. ORDER NO.: NRC-HQ-60-17-T-0001

4. REQUISITION/REFERENCE NO.: RES-17-0463

5. ISSUING OFFICE *(Address correspondence to)*:
US NRC - HQ
ACQUISITION MANAGEMENT DIVISION
MAIL STOP 3WFN-05-C64MP
ATTN ROB ROBINSON 301-287-0905
WASHINGTON DC 20555-0001

6. SHIP TO:

a. NAME OF CONSIGNEE: US NUCLEAR REGULATORY COMMISSION-

b. STREET ADDRESS: MAIL PROCESSING CENTER
4930 BOILING BROOK PARKWAY

c. CITY: ROCKVILLE

d. STATE: MD

e. ZIP CODE: 20852

7. TO: WILLIAM ARCIERI

a. NAME OF CONTRACTOR: INFORMATION SYSTEMS LABORATORIES INC

b. COMPANY NAME:

c. STREET ADDRESS: 11140 ROCKVILLE PIKE

d. CITY: ROCKVILLE

e. STATE: MD

f. Z P CODE: 20852-3106

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)*: 02/19/2020

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 U.S. Nuclear Regulatory Commission hereby issues Task Order 3 (NRC-HQ-60-17-T-0001) in support of the project entitled, "Assess Methods for Large System Code Performance Evaluation and Uncertainty Quantification using the TRACE Continued ...					

18. SHIPPING POINT:

19. GROSS SHIPPING WEIGHT:

20. INVOICE NO.:

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

21. MAIL INVOICE TO:

SEE BILLING INSTRUCTIONS ON REVERSE

a. NAME: US NUCLEAR REGULATORY COMMISSION

b. STREET ADDRESS (or P.O. Box): ONE WHITE FLINT NORTH
11555 ROCKVILLE PIKE
MAILSTOP O3-E17A

c. CITY: ROCKVILLE

d. STATE: MD

e. Z P CODE: 20852-2738

17(i) GRAND TOTAL: $348,543.00

22. UNITED STATES OF AMERICA BY *(Signature)*: 09/14/2017 [redacted]

23. NAME *(Typed)*: RICHARD W. ROBINSON
TITLE: CONTRACTING/ORDER NG OFFICER

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

DATE OF ORDER	CONTRACT NO.	ORDER NO.
09/14/2017	NRC-HQ-60-14-E-0002	NRC-HQ-60-17-T-0001

ITEM NO. (a)	SUPPLIES/SERVICES (b)	QUANTITY ORDERED (c)	UNIT (d)	UNIT PRICE (e)	AMOUNT (f)	QUANTITY ACCEPTED (g)
	Code." This Task Order is issued against the Base IDIQ (NRC-HQ-60-14-E-0002), entitled "Maintenance of Computer Codes II." Specific details regarding this Task Order, to include contract clauses and Statement of Work, are included in the attached pages. Period of Performance: Date of Award - 2/19/2020 Total Task Ordering Ceiling: $348,543.00 Total Obligated Amount: $240,000.00 Contractor Acceptance of Task Order NRC-HQ-60-17-T-0001 _____ DESIGNATED AUTHORIZED SIGNATURE _____ DATE _____ TITLE Accounting Info: 2017-X0200-FEEBASED-60-60D003-60B301-1147-11-6-213-252A-11-6-213-1147 Period of Performance: 09/14/2017 to 02/19/2020					

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

SECTION B - Supplies or Services/Prices

B.1 BRIEF PROJECT TITLE AND WORK DESCRIPTION

(a) The title of this project is: Assess Methods for Large System Code Performance Evaluation and Uncertainty Quantification using the TRACE Code.

(b) Summary work description: The focus of this task is to demonstrate a statistical methodology, based on principal components analysis, with a proof-of-principle through an application of the sequence TRACE/SNAP/DAKOTA codes, and in particular to demonstrate an assessment of techniques for the identification of the main sources of uncertainty and their quantification.

B.2 CONSIDERATION AND OBLIGATION—COST-PLUS-FIXED-FEE ALTERNATE I

(a) The total estimated cost to the Government for full performance of this contract is $348,543.00 of which the sum of $325,355.00 represents the estimated reimbursable costs, and of which $23,188.00 represents the fixed-fee.

(b) There shall be no adjustment in the amount of the Contractor's fixed fee.

(c) The amount currently obligated by the Government with respect to this contract is $240,000.00, [redacted]

(d) It is estimated that the amount currently obligated will cover performance through September 30, 2018.

(e) This is an incrementally-funded contract and FAR 52.232-22 - “Limitation of Funds” applies.

(f) In accordance with FAR 52.216-8 - Fixed Fee, it is the policy of the NRC to withhold payment of fee after payment of 85 percent of the fee has been paid in order to protect the Government’s interest. [redacted].

B.3 COST SCHEDULE

Period of Performance: Date of Award – February 19, 2020

CLIN	DESCRIPTION	ESTIMATED COST
[redacted]	[redacted]	[redacted]
TOTAL		**$348,543.00**

SECTION C - Description/Specifications

C.1 TASK ORDER STATEMENT OF WORK

C.1.1 PROJECT TITLE

Assess Methods for Large System Code Performance Evaluation and Uncertainty Quantification using the TRACE Code.

C.1.2 BACKGROUND

The rapid increase in computing power over the last two decades has led to very complex computer codes for safety analyses of reactor systems. When Title10, of the Code of Federal Regulations (CFR) 50.46 was revised in 1988, the regulation permitting “best estimate” Loss-Of-Coolant Accident (LOCA) analysis specified that the regulatory criteria are to be met with “a high probability” and that an appropriate statistical method be used to determine the uncertainty in the analysis. At U.S. Nuclear Regulatory Commission (NRC), the TRAC/RELAP Advanced Computational Engine (TRACE) code is being developed for best-estimate analysis of reactor systems. The Symbolic Nuclear Analysis Package (SNAP) was developed to provide user interface between TRACE code and SNAP, with an enhancement by the Design Analysis Kit for Optimization and Terascale Applications (DAKOTA) to add features for statistical analysis capabilities. Since enactment of the rule change, an increasing number of analyses utilize “best estimate” analysis rather than continuing to use Appendix K. Several methods of determining code uncertainty have been submitted to the staff for review. The reviews of these methods have been long, complex, difficult, and controversial. The agency’s review process would be greatly improved and shortened if the staff could perform independent and consistent assessments of large system code performance and uncertainty quantification for particular applications. This task order is to develop a computational framework for staff that allows for global variance-based methods for identifying and quantifying code uncertainties, and development of benchmark problems for purpose of reducing review time and effort and allowing for better review process standardization.

C.1.3 SCOPE

The focus of this task is to demonstrate a statistical methodology, based on principal components analysis, with a proof-of-principle through an application of the sequence TRACE/SNAP/DAKOTA codes, and in particular to demonstrate an assessment of techniques for the identification of the main sources of uncertainty and their quantification.

C.1.4 APPLICABLE DOCUMENTS AND STANDARDS

Background information on licensing of domestic nuclear reactor can be found in NRC Regulations, Title 10, Code of Federal Regulations Title 50 Sec. 46, about maximum clad temperature and other parameters relevant to the safety of the reactor coolant system. DAKOTA Uncertainty Analysis is provided as a SNAP plug-in. This plug-in, when used together with TRACE/SNAP, perform uncertainty

analysis. DAKOTA is an open-source toolkit developed at Sandia National Laboratories. Resources for DAKOTA are available at http://dakota.sandia.gov.

C.1.5 SPECIFIC TASKS

The following three tasks are expected as part of the initial proof-of-principle project phase. The work scope outline is provided for each of the identified tasks.

Task 1: Generate TRACE Predictions for a Selected Experiment and Production of an Integral-Data Matrix for TRACE Code Performance Statistical Evaluation

Subtask 1A: Generate a Proof-of-Principle TRACE Application Case

The contractor shall select one integral-effects test (IET) from the documented TRACE assessment cases for the initial proof-of-principle project phase. This selection shall be based on expert insights in performing best-estimate methodologies review and licensing reactor thermal hydraulic (TH) safety analyses, TH computer model development and assessment, TH experimental data production and phenomenological data evaluation, and knowledge of the existing reactor TH databases. For the selected IET facility, the contractor shall simulate one experiment (test run) from the available data base to generate the TRACE prediction data for the proof-of-principle TRACE application case. The contractor shall develop an input model for the proof-of-principle TRACE application case by implementing the proper boundary and initial conditions corresponding to the application experiment; examining key model inputs including modeling options and nodalization features on system- and component-wide bases and implementing necessary model changes; and troubleshooting TRACE execution. The contractor shall generate a series of calculation runs for sets of randomized model parameters, applying an appropriately selected version of the TRACE code. These TRACE code predictions will be examined visually with regard to their plausibility in comparison to test data, adequacy of the applied convergence and time-step control criteria, and expected sensitivities to variations in selected key modeling inputs relative to both nodalization and code modeling features/options to confirm the soundness of the applied proof-of-principle TRACE test case model.

Subtask 1B: Generate a Data Matrix for Statistical Evaluation

The contractor shall define a set of figures of merit (FOMs) for the analyzed TH IET test case chosen from the measured TH parameters that are key to TH phenomena and test data; spatial location, distribution, and type of instrumentation sensors. Proposed FOMs will be based on direct measurements to reflect the phenomenological content of the analyzed test case. For each defined FOM, a comparative set of both test data and TRACE predicted data histories will be generated on a consistent basis with regard to both time and space by producing each set of measured and computed FOM values as related to appropriately determined common points in time on a consistent time scale; and, by applying a test facility nodalization scheme that appropriately accounts for the spatial location of instrumentation sensors. The produced sets of FOMs will be used to generate a data matrix suitable for the purpose of the statistical evaluation of the proof-of-

principle TRACE application case. The contractor shall devise a process of matrix generation based on the following principles: it will generate results using direct access to test data; it will generate results on a consistent time scale; it will allow for data matrix expansion; and it will produce output results in formats suitable for interfacing to different statistical engines. The proof-of-principle TRACE application case shall demonstrate the process of the data matrix construction using TRACE-generated data and will serve as an example case outlining the prospect for a platform-based automated matrix-generation approach using SNAP.

Task 2: Use the Example of TRACE Application Case to perform a Proof-of-Principle Statistical Evaluation of the TRACE Performance

The following analysis capabilities shall be demonstrated in the context of the TRACE analysis of the IET/SET experiment and the concomitant FOM-based integral-data matrix developed in Task 1.

1) Two techniques for random sampling of the model parameters shall be applied and evaluated: Latin hypercube sampling (LHS) and quasi-random Sobol's sequences.

2) The transient data generated in Task 1 for selected FOMs shall be plotted and visually assessed with regard to consistency of measured vs. computed behavior.

3) Statistical properties of the computed data matrices for FOMs that have been deemed not consistent with the measured values shall be statistically analyzed by assessing the transient properties of Spearman's correlation coefficient and the correlation ratio.

4) An assessment of the order of influence of the model parameters on the computed FOMs shall be made through two global variance-based sensitivity analyses: principal components analysis and Sobol' sensitivity indices variance decomposition.

5) Based on the results of model parameter ordering, an assessment of order reduction of the code parameters shall be made.

An approach shall be devised and tested that allows for the exclusion and/or identification of possible impact on the results from the analyses, performed in Task 2 under the above identified steps, stemming from inadequacy and/or limitations of the spatial/time discretization of the numerical solution including implemented nodalization features.

Task 3: Large System Code Performance Evaluation and Uncertainty Quantification Process Outline and Documentation of the Proof-of-Principle TRACE Application Case

The rationale and concept for the proposed process of large system code performance evaluation and uncertainty quantification (UQ) shall be documented in a technical report intended and suitable for release as a NUREG publication. The application feasibility and practical potential of the described process for the purpose of enhancing the NRC regulatory and licensing practice related to safety evaluation

of complex codes shall be demonstrated on the basis of the performed proof-of-principle TRACE application case. The capabilities, versatility, suitability, and adaptiveness of the implemented code performance evaluation method will be revealed by exemplifying its practical application and outcome, to a degree possible on a case-specific basis, by performing the key elements of the outlined process. The results from the proof-of-principle TRACE performance evaluation on the basis of the performed code application case will be used to identify and justify further development of a standardized uncertainty quantification methodology.

1) Data matrix construction with TRACE-generated data: As part of this element, key requirements for its platform-based automated implementation in SNAP will be outlined.

2) Identification of code model development and experimental data gathering needs: As part of this subtask the contractor shall develop a reduced order model that allows the identification and the weight of importance of experimental data for calibration of TRACE.

3) Code calibration and benchmarking: As part of this element, the potential for model calibration and code benchmarking will be exemplified for the purpose of compliance demonstration within the framework of regulatory decision making.

4) Verify the effects of small code changes on the stability of the solution: As part of this element, the potential for quantifying the effects of small code changes on a system-wide basis for large system codes and methodologies based on the coupling of such codes will be considered.

C.1.6 DELIVERABLES AND DELIVERY SCHEDULE

A Monthly Letter Status Report (MLSR) describing the work performed under this contract modification will be submitted to the NRC Project Manager by the 20th of the month following the month to be reported with copies provided to the following:

RESDSAMLSR.Resource@nrc.gov

The MLSR will identify the title of the project, the job code, the Principal Investigator, the period of performance, the reporting period, summarize each month's technical progress, list monthly spending, total spending to date, and the remaining funds and will contain information as directed in NRC Management Directive 11.1. Any administrative or technical difficulties which may affect the schedule or costs of the project will be immediately brought to the attention of the NRC Project Manager

The period of performance (POP) for this Task Order will be 29 months starting from the date on which the Task Order is awarded by NRC. The specific deliverables, estimated level of effort (LOE) and the associated delivery deadlines are outlined below individually for each task and subtask in the Task Order.

In addition to the MLSR, the following deliverables will be prepared and delivered to NRC according to the identified milestone for each individual task:

Deliverable for Subtask 1A: A technical letter report in the form of a memo describing the analysis of the chosen proof-of-principle IET TH experiment. This report describes the list of key TH phenomena addressed, parametric studies providing the rationale for their choice and their governing modeling parameters.

Delivery Schedule: 10 Months after task order award

Deliverable for Subtask 1B: A computer file of the data matrix, for key figures-of-merit for statistical analysis, based on the analyses in Subtask 1A.

Delivery Schedule: 12 Months after task order award

Deliverable for Task 2A: A technical letter report in the form of a memo describing the statistical analyses through graphic display and statistical hypothesis tests of the results of the proof-of-principle case of the IET experiment developed in Task1. The NRC will review the technical letter report provided as a deliverable under this Subtask. The NRC anticipates a 2 week review period prior to submitting comments to the contractor to be incorporated into the final letter report.

Delivery Schedule:
1) Draft due 17 months after Task Order Award.
2) Final due 2 weeks after receipt of NRC comments.

Deliverable for Task 2B: A technical letter report in the form of a memo describing the tests of the efficiency of introducing code corrections based on the identified inadequacies and/or limitations elicited via the global variance-based statistical analyses of Task 2A. The NRC will review the technical letter report provided as a deliverable under this Subtask. The NRC anticipates a 2 week review period prior to submitting comments to the contractor to be incorporated into the final letter report.

Delivery Schedule:
1) Draft due 20 months after Task Order Award.
2) Final due 2 weeks after receipt of NRC comments.

Deliverable for Task 3: Final documentation in a NUREG/CR report format describing the essential theoretical foundations of Tasks 1 and 2, and the quantitative results of the proof-of-principle case analyses. The report will also address the following elements to be considered for future developments for consistent evaluation of UQ analyses via large reactor system computer codes. The draft shall be submitted 2 month before the end of performance period to allow staff review and comments. After receipt of comments, the contractor shall incorporate all changes into the final NUREG/CR report.

Delivery Schedule:
1) Draft due 27 Months after task order award
2) Final due 3 weeks after receipt of NRC comments.

C.1.7 REQUIRED LABOR CATEGORIES (Except for Information Technology Services)

The contractor shall provide personnel that are experienced in thermal-hydraulic analysis. Familiarity of TRACE/SNAP plant model development and statistical methods of analysis are required. In addition, the project requires computer capabilities to perform model development and code validation.

The contractor is responsible for assigning technical staff, employees, subcontractors, or specialists who have the above mentioned qualification experience, or combination thereof to meet the technical objectives of the work specified in this statement of work. NRC will rely on the contractor to verify the qualifications of the personnel assigned to this contract including assurance that all information contained in the technical and cost proposals (including resumes) is accurate and truthful.

The use of key personnel and any proposed change to key personnel on this contract is subject to the NRC Contracting Officer's Representative's (COR) approval.

For any work to be subcontracted or performed by consultants, the contractor shall obtain the NRC COR's written approval of the subcontractor or consultant prior to initiation of the subcontract effort. Conflict-of-interest considerations shall apply to any subcontracted effort.

C.1.8 GOVERNMENT-FURNISHED PROPERTY

NRC will provide the appropriate version of TRACE/SNAP and User Manuals and the selected IET test data upon request from the contractor.

C.1.9 PLACE OF PERFORMANCE

The work will be performed at the contractor's site. Describe any local or long distance travel the contractor will be required to perform.

C.1.10 SECURITY

This work is UNCLASSIFIED, but may utilize pre-determination information and proprietary test data. The required security form (NRC Form 187 – Contract Security and/or Classification Requirements) must be provided with the requisition.

SECTION D - Packaging and Marking

D.1 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 NRC-HQ-60-14-E-0002 - NRC-HQ-60-17-T-0001.

D.2 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.

SECTION E - Inspection and Acceptance

[**NO CONTENT**]

SECTION F - Deliveries or Performance

F.1 TASK/DELIVERY ORDER PERIOD OF PERFORMANCE (SEP 2013)

This order shall commence on the Date of Award and will expire on February 19, 2020.

F.2 PLACE OF DELIVERY-REPORTS

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

Electronic Copies:

Name: Kirk Tien
Title: Contracting Officer's Representative (COR)
E-mail: kirk.tien@nrc.gov

Name: Rob Robinson
Title: Contracting Officer (CO)
E-mail: richard.robinsonii@nrc.gov

F.3 DELIVERABLES AND DELIVERABLE SCHEDULE

See Section C.1.6

SECTION G - Contract Administration Data

G.1 REGISTRATION IN FEDCONNECT® (JULY 2014)

The Nuclear Regulatory Commission (NRC) uses Compusearch Software Systems' secure and auditable two-way web portal, FedConnect®, to communicate with vendors and contractors. FedConnect® provides bi-directional communication between the vendor/contractor and the NRC throughout pre-award, award, and post-award acquisition phases. Therefore, in order to do business with the NRC, vendors and contractors must register to use FedConnect® at https://www.fedconnect.net/FedConnect. The individual registering in FedConnect® must have authority to bind the vendor/contractor. There is no charge for using FedConnect®. Assistance with FedConnect® is provided by Compusearch Software Systems, not the NRC. FedConnect® contact and assistance information is provided on the FedConnect® web site at https://www.fedconnect.net/FedConnect.

G.2 ELECTRONIC PAYMENT (SEP 2014)

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-Central Contractor Registration".

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: NRCPayments@nrc.gov.

G.3 2052.215-70 KEY PERSONNEL. (JAN 1993)

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

[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.

G.4 2052.215-71 PROJECT OFFICER AUTHORITY. (OCT 1999)

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

Name: Kirk Tien

Address: Kirk.tien@nrc.gov

Telephone Number: 301-415-1606

(b) Performance of the work under this contract is subject to the technical direction of the NRC project officer. 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 project officer or must be confirmed by the project officer 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 project officer's authority under the provisions of this clause.

(f) If, in the opinion of the contractor, any instruction or direction issued by the project officer 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 project officer 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.

SECTION H - Special Contract Requirements

H.1 USE OF AUTOMATED CLEARING HOUSE (ACH) ELECTRONIC PAYMENT/REMITTANCE ADDRESS

The Debt Collection Improvement Act of 1996 requires that all Federal payments except IRS tax refunds be made by Electronic Funds Transfer. It is the policy of the Nuclear Regulatory Commission to pay government vendors by the Automated Clearing House (ACH) electronic funds transfer payment system. Item 15C of the Standard Form 33 may be disregarded.

H.2 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.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.

SECTION I - Contract Clauses

[**NO CONTENT – Contained in Base Award NRC-HQ-60-14-E-0002**]

SECTION J - List of Documents, Exhibits and Other Attachments

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

Attachment Number	Title	Date
1	Billing Instructions – Cost Reimbursement Type Contracts	7/6/15