

ORDER FOR SUPPLIES OR SERVICES

PAGE OF PAGES

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33

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

1. DATE OF ORDER 09/10/2019		2. CONTRACT NO. (If any) NRC-HQ-60-15-A-0001		6. SHIP TO: a. NAME OF CONSIGNEE U.S. Nuclear Regulatory Commission-	
3. ORDER NO. 31310019F0039		4. REQUISITION/REFERENCE NO. RES-19-0317			
5. ISSUING OFFICE (Address correspondence to) U.S. NRC - HQ Acquisition Management Division Mail Stop: TWFN-07B20M Washington DC 20555-0001				b. STREET ADDRESS Mail Processing Center 4930 Boiling Brook Parkway	
				c. CITY Rockville	e. ZIP CODE 20852
7. TO: Tracey Mullinix				f. SHIP VIA	
a. NAME OF CONTRACTOR ENERGY RESEARCH, INC.				8. TYPE OF ORDER	
b. COMPANY NAME				<input type="checkbox"/> 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.	
c. STREET ADDRESS P.O. BOX 2034				<input checked="" type="checkbox"/> 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.	
d. CITY ROCKVILLE		e. STATE MD	f. ZIP CODE 208472034		
9. ACCOUNTING AND APPROPRIATION DATA See Schedule				10. REQUISITIONING OFFICE Off of Nuclear Reg Research	

11. BUSINESS CLASSIFICATION (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 BUSINESS (WOSB) ELIGIBLE UNDER THE WOSB PROGRAM ☐ h. EDWOSB

12. F.O.B. POINT

13. PLACE OF

a. INSPECTION
Destinationb. ACCEPTANCE
Destination

14. GOVERNMENT B/L NO.

15. DELIVER TO F.O.B. POINT
ON OR BEFORE (Date)

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)
	GSA Contract #: GS23F0110M The U.S. Nuclear Regulatory Commission hereby issues the 7th Task Order (31310019F0039) under entitled, "TRACE Plant Model Development and Maintenance in Anticipation of New Rulemaking and Continued ...					

SEE BILLING INSTRUCTIONS ON REVERSE	18. SHIPPING POINT		19. GROSS SHIPPING WEIGHT		20. INVOICE NO.		17(h) TOTAL (Cont. pages)		
	21. MAIL INVOICE TO:								
	a. NAME Fiscal Accounting Program						\$0.00		
	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	\$430,211.70	17(i) GRAND TOTAL

22. UNITED STATES OF

AMERICA BY (Signature)

09/10/2019

23. NAME (Typed)

TITLE: CONTRACTING/ORDERING OFFICER

ORDER FOR SUPPLIES OR SERVICES
SCHEDULE - CONTINUATION

PAGE NO
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IMPORTANT: Mark all packages and papers with contract and/or order numbers.

DATE OF ORDER	CONTRACT NO.	ORDER NO.
09/10/2019	NRC-HQ-60-15-A-0001	31310019F0039

ITEM NO. (a)	SUPPLIES/SERVICES (b)	QUANTITY ORDERED (c)	UNIT (d)	UNIT PRICE (e)	AMOUNT (f)	QUANTITY ACCEPTED (g)
	<p>Exploratory Simulations"</p> <p>This call is issued under BPA number GS23F0110M - NRC-HQ-60-15-A-0001.</p> <p>Total Ceiling Amount: \$430,211.70 Total Obligated Amount: \$250,000.00</p> <p>See attached pages for specific terms and conditions, as well as Statement of Work for this order.</p> <p>Contractor Acceptance of Task Order 31310019F0039 under BPA No. NRC-HQ-60-15-A-0001:</p> <p>_____ Signature</p> <p>_____ Name</p> <p>_____ Title</p> <p>_____ Date</p> <p>Accounting Info: 2019-X0200-FEEBASED-60-60D003-60B301-1147-11 -6-174-252A-11-6-174-1147 Period of Performance: 09/10/2019 to 07/31/2020</p>					

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

\$0.00

SECTION A - Solicitation/Contract Form

A.1 BRIEF PROJECT TITLE AND WORK DESCRIPTION

(a) The title of this project is: TRACE Plant Model Development and Maintenance in Anticipation of New Rulemaking and Exploratory Simulations

(b) Summary work description: The contractor shall provide technical assistance in the updating, verifying, and documenting of the TRACE models for Oconee Unit 1, Palo Verde Unit 1, and Point Beach Unit in accordance with the latest version of the TRACE PWR Modeling Guidelines. Additionally, all models shall be verified by performing steady-state and transient calculations, and the modeling details and simulation results for each model shall be documented.

(End of Clause)

A.2 CONSIDERATION AND OBLIGATION-TASK ORDERS

(a) The ceiling of this order for services is \$430,211.70.

(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 \$250,000.00. 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.

(End of clause)

A.3 PRICE/COST SCHEDULE

CLIN	DESCRIPTION	EST. QTY	UNIT	GSA SCHEDULE YEAR 18 RATES	GSA SCHEDULE YEAR 19 RATES	EST. TOTAL
0001	Executive	300	Hr.			
0002	Executive Engineer / Scientist	90	Hr.			
0003	Corporate Engineer / Scientist	1050	Hr.			
0004	Senior Engineer / Scientist	1860	Hr.			
SUBTOTAL		3300	Hr.			
005	ODCS / LOCAL TRAVEL					
TOTAL CEILING						\$430,211.70

A.4 TASK/DELIVERY ORDER PERIOD OF PERFORMANCE (SEP 2013)

This order shall commence on **Date of Award** and will expire on **July 31, 2020**.

(End of Clause)

A.5 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]

[REDACTED]

[REDACTED]

[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.

A.6 2052.215-71 CONTRACTING OFFICER REPRESENTATIVE (COR) AUTHORITY. (OCT 1999)

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

Name: Shawn Marshall

Email Address: Shawn.Marshall@nrc.gov

Telephone Number: 301-415-2361

(b) Alternate contracting officer's representative (COR) is:

Name: Tarek Zaki

Email Address: Tarek.Zaki@nrc.gov

Telephone Number: 301-415-0994

(c) 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.

(d) 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.

(e) 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.

(f) 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.

(g) 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.

(h) 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.

(i) 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.

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

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

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

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

(End of Clause)

A.7 AWARD NOTIFICATION AND COMMITMENT OF PUBLIC FUNDS

(a) All offerors will receive preaward and postaward notices in accordance with FAR 15.503.

(b) It is also brought to your attention that the contracting officer is the only individual who can legally obligate funds or commit the NRC to the expenditure of public funds in connection with this procurement. This means that unless provided in a contract document or specifically authorized by the contracting officer, NRC technical personnel may not issue contract modifications, give formal contractual commitments, or otherwise bind, commit, or obligate the NRC contractually. Informal unauthorized commitments, which do not obligate the NRC and do not entitle the contractor to payment, may include:

(1) Encouraging a potential contractor to incur costs prior to receiving a contract;

(2) Requesting or requiring a contractor to make changes under a contract without formal contract modifications;

(3) Encouraging a contractor to incur costs under a cost-reimbursable contract in excess of those costs contractually allowable; and

(4) Committing the Government to a course of action with regard to a potential contract, contract change, claim, or dispute.

(End of Clause)

A.8 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.

(End of Clause)

A.9 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.

(End of Clause)

A.10 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.

(End of Clause)

**A.11 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)

A.12 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)

A. 13 DRUG FREE WORKPLACE TESTING: UNESCORTED ACCESS TO NUCLEAR FACILITIES, ACCESS TO CLASSIFIED INFORMATION OR SAFEGAUARDS INFORMATION, OR PERFORMING IN SPECIALLY SENSITIVE POSITIONS (OCT 2014)

All contractor employees, subcontractor employees, applicants, and consultants proposed for performance or performing under this contract shall be subject to pre-assignment, random, reasonable suspicion, and post-accident drug testing applicable to: (1) individuals who require unescorted access to nuclear power plants, (2) individuals who have access to classified or safeguards information, (3) individuals who are required to carry firearms in performing security services for the NRC, (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, or (6) individuals who admit to recent illegal drug use or those who are found through other means to be using drugs illegally.

The NRC Drug Program Manager will schedule the drug testing for all contractor employees, subcontractor employees, applicants, and consultants who are subject to testing under this clause. The consequences of refusing to undergo drug testing or a refusal to cooperate in such testing, including not appearing at the scheduled appointment time, will result in the Agency's refusal of the contractor employee to work under any NRC contract. Any NRC contractor employee found to be using, distributing or possessing illegal drugs, or any contractor employee who fails to receive a verified negative drug test result under this program while in a duty status will immediately be removed from working under the NRC contract. The contractor's employer will be notified of the denial or revocation of the individual's authorization to have access to information and ability to perform under the contract. The individual may not work on any NRC contract for a period of not less than one year from the date of the failed, positive drug test and will not be considered for reinstatement unless evidence of rehabilitation, as determined by the NRC "drug testing contractor's" Medical Review Officer, is provided.

Contractor drug testing records are protected under the NRC Privacy Act Systems of Records, System 35, "Drug Testing Program Records - NRC" found at: <http://www.nrc.gov/reading-rm/foia/privacy-systems.html>

A.14 SECURITY REQUIREMENTS RELATING TO THE PRODUCTION OF REPORTS OR THE PUBLICATION OF RESULTS UNDER CONTRACTS, AGREEMENTS, AND GRANTS (JUL 2016)

Review and Approval of Reports

(a) Reporting Requirements. The contractor/grantee shall comply with the terms and conditions of the contract/grant regarding the contents of the draft and final report, summaries, data, and related documents, to include correcting, deleting, editing, revising, modifying, formatting, and supplementing any of the information contained therein, at no additional cost to the NRC. Performance under the contract/grant will not be deemed accepted or completed until it complies with the NRC's directions, as applicable. The reports, summaries, data, and related documents will be considered draft until approved by the NRC. The contractor/grantee agrees that the direction, determinations, and decisions on approval or disapproval of reports, summaries, data, and related documents created under this contract/grant remain solely within the discretion of the NRC.

(b) Publication of Results. Prior to any dissemination, display, publication, or release of articles, reports, summaries, data, or related documents developed under the contract/grant, the contractor/grantee shall submit them to the NRC for review and approval. The contractor/grantee shall not release, disseminate, display or publish articles, reports, summaries, data, and related documents, or the contents therein, that have not been reviewed and approved by the NRC for release, display, dissemination or publication. The contractor/grantee agrees to conspicuously place any disclaimers, markings or notices, directed by the NRC, on any articles, reports, summaries, data, and related documents that the contractor/grantee intends to release, display, disseminate or publish to other persons, the public, or any other entities. The contractor/grantee agrees, and grants, a royalty-free, nonexclusive, irrevocable worldwide license to the government, to use, reproduce, modify, distribute, prepare derivative works, release, display or disclose the articles, reports, summaries, data, and related documents developed under the contract/grant, for any governmental purpose and to have or authorize others to do so.

(c) Identification/Marking of Sensitive Unclassified Non-Safeguards Information (SUNSI) and Safeguards Information (SGI). The decision, determination, or direction by the NRC that information possessed, formulated or produced by the contractor/grantee constitutes SUNSI or SGI is solely within the authority and discretion of the NRC. In performing the contract/grant, the contractor/grantee shall clearly mark SUNSI and SGI, to include for example, OUO-Allegation Information or OUO-Security Related Information on any reports, documents, designs, data, materials, and written information, as directed by the NRC. In addition to marking the information as directed by the NRC, the contractor shall use the applicable NRC cover sheet (e.g., NRC Form 461 Safeguards Information) in maintaining these records and documents. The contractor/grantee shall ensure that SUNSI and SGI is handled, maintained and protected from unauthorized disclosure, consistent with NRC policies and directions. The contractor/grantee shall comply with the requirements to mark, maintain, and protect all information, including documents, summaries, reports, data, designs, and materials in accordance with the provisions of Section 147 of the Atomic Energy Act of 1954 as amended, its implementing regulations (10 CFR 73.21), Sensitive Unclassified Non-

Safeguards and Safeguards Information policies, and NRC Management Directives and Handbooks 12.5, 12.6 and 12.7.

(d) Remedies. In addition to any civil, criminal, and contractual remedies available under the applicable laws and regulations, failure to comply with the above provisions, and/or NRC directions, may result in suspension, withholding, or offsetting of any payments invoiced or claimed by the contractor/grantee.

(e) Flowdown. If the contractor/grantee intends to enter into any subcontracts or other agreements to perform this contract/grant, the contractor/grantee shall include all of the above provisions in any subcontracts or agreements.

A.15 NRC INFORMATION TECHNOLOGY SECURITY

NRC INFORMATION TECHNOLOGY SECURITY TRAINING (MAY 2016)

NRC contractors shall ensure that their employees, consultants, and subcontractors with access to the agency's information technology (IT) equipment and/or IT services complete NRC's online initial and refresher IT security training requirements to ensure that their knowledge of IT threats, vulnerabilities, and associated countermeasures remains current. Both the initial and refresher IT security training courses generally last an hour or less and can be taken during the employee's regularly scheduled work day.

Contractor employees, consultants, and subcontractors shall complete the NRC's online annual, "Computer Security Awareness" course on the same day that they receive access to the agency's IT equipment and/or services, as their first action using the equipment/service. For those contractor employees, consultants, and subcontractors who are already working under this contract, the on-line training must be completed in accordance with agency Network Announcements issued throughout the year, within three weeks of issuance of this modification.

Additional annual required online NRC training includes but is not limited to the following:

- (1) Information Security (INFOSEC) Awareness
- (2) Continuity of Operations (COOP) Awareness
- (3) Defensive Counterintelligence and Insider Threat Awareness
- (4) No FEAR Act
- (5) Personally Identifiable Information (PII) and Privacy Act Responsibilities Awareness

Contractor employees, consultants, and subcontractors who have been granted access to NRC information technology equipment and/or IT services must continue to take IT security refresher training offered online by the NRC throughout the term of the contract. Contractor employees will receive notice of NRC's online IT security refresher training requirements through agency-wide notices.

Contractor Monthly Letter Status Reports (MLSR) must include the following information for all completed training:

- (1) the name of the individual completing the course;

(2) the course title; and

(3) the course completion date.

The MLSR must also include the following information for those individuals who have not completed their required training:

(1) the name of the individual who has not yet completed the training;

(2) the title of the course(s) which must still be completed; and

(3) the anticipated course completion date(s).

The NRC reserves the right to deny or withdraw Contractor use or access to NRC IT equipment and/or services, and/or take other appropriate contract administrative actions (e.g., disallow costs, terminate for cause) should the Contractor violate the Contractor's responsibility under this clause.

(End of Clause)

A.16 FOREIGN OWNERSHIP, CONTROL, OR INFLUENCE OVER CONTRACTOR

The National Industrial Security Program Operating Manual (NISPOM) implements the provisions of E.O. 12829, "National Industrial Security Program." A company is considered to be under FOCI whenever a foreign interest has the power, direct or indirect, whether or not exercised, and whether or not exercisable through the ownership of the U.S. company's securities, by contractual arrangements or otherwise, to direct or decide matters affecting the management or operations of that company in a manner that may result in unauthorized access to classified information or may adversely affect the performance of classified information contracts. (See NRC Management Directive 12.2 – "NRC Classified Information Security Program")

(a) For purposes of this clause, a foreign interest is defined as any of the following:

(1) A foreign government or foreign government agency;

(2) Any form of business enterprise organized under the laws of any country other than the United States or its possessions;

(3) Any form of business enterprise organized or incorporated under the laws of the U.S., or a State or other jurisdiction within the U.S., which is owned, controlled, or influenced by a foreign government, agency, firm, corporation or person; or

(4) Any person who is not a U.S. citizen.

(b) A U.S. company determined to be under FOCI is not eligible for facility clearance (FCL). If a company already has an FCL, the FCL shall be suspended or revoked unless security measures are taken to remove the possibility of unauthorized access to classified information.

(c) For purposes of this clause, subcontractor means any subcontractor at any tier and the term "contracting officer" shall mean NRC contracting officer. When this clause is

included in a subcontract, the term "contractor" shall mean subcontractor and the term "contract" shall mean subcontract.

(d) The contractor shall complete and submit and SF-328, DD-441 and DD-441-1 forms, prior to contract award. The information contained in these forms may be used in making a determination as to whether a contractor is eligible to participate in the National Industrial Security Program and have a facility security clearance.

(e) The contractor shall immediately provide the contracting officer written notice of any changes in the extent and nature of FOCI over the contractor which would affect the answers to the questions presented in SF-328, "Certificate Pertaining to Foreign Interest". Further, notice of changes in ownership or control which are required to be reported to the Securities and Exchange Commission, the Federal Trade Commission, or the Department of Justice shall also be furnished concurrently to the contracting officer.

(f) In those cases where a contractor has changes involving FOCI, the NRC must determine whether the changes will pose an undue risk to the common defense and security. In making this determination, the contracting officer shall consider proposals made by the contractor to avoid or mitigate foreign influences.

(g) The contractor agrees to insert terms that conform substantially to the language of this clause including this paragraph (g) in all subcontracts under this contract that will require access to classified information and shall require such subcontractors to submit completed SF-328, DD-441 and DD-441-1 forms prior to award of a subcontract. Information to be provided by a subcontractor pursuant to this clause may be submitted directly to the contracting officer.

(h) Information submitted by the contractor or any affected subcontractor as required pursuant to this clause shall be treated by NRC to the extent permitted by law, as business or financial information submitted in confidence to be used solely for purposes of evaluating FOCI.

(i) The requirements of this clause are in addition to the requirement that a contractor obtain and retain the security clearances required by the contract. This clause shall not operate as a limitation on NRC's rights, including its rights to terminate this contract.

(j) The contracting officer may terminate this contract for default either if the contractor fails to meet obligations imposed by this clause, e.g., provide the information required by this clause, comply with the contracting officer's instructions about safeguarding classified information, or make this clause applicable to subcontractors, or if, in the contracting officer's judgment, the contractor creates a FOCI situation in order to avoid performance or a termination for default. The contracting officer may terminate this contract for convenience if the contractor becomes subject to FOCI and for reasons other than avoidance of performance of the contract, cannot, or chooses not to, avoid or mitigate the FOCI problem.

(End of Clause)

A.17 COMPLIANCE WITH U.S. IMMIGRATION LAWS AND REGULATIONS

NRC contractors are responsible to ensure that their alien personnel are not in violation of United States immigration laws and regulations, including employment authorization documents and visa requirements. Each alien employee of the Contractor must be lawfully admitted for permanent residence as evidenced by Permanent Resident Form I-551 (Green Card), or must present other evidence from the U.S. Department of Homeland Security/U.S. Citizenship and Immigration Services that employment will not affect his/her immigration status. The U.S. Citizenship and Immigration Services provides information to contractors to help them understand the employment eligibility verification process for non-US citizens. This information can be found on their website, <http://www.uscis.gov/portal/site/uscis>.

The NRC reserves the right to deny or withdraw Contractor use or access to NRC facilities or its equipment/services, and/or take any number of contract administrative actions (e.g., disallow costs, terminate for cause) should the Contractor violate the Contractor's responsibility under this clause.

(End of Clause)

A.18 PLACE OF DELIVERY-REPORTS

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

Electronic copies to:

Shawn Marshall, Contracting Officer's Representative
Shawn.Marshall@nrc.gov

Jennifer Dudek, Contracting Officer
Jennifer.Dudek@nrc.gov

(End of Clause)

A.19 INSPECTION AND ACCEPTANCE BY THE NRC (SEP 2013)

Inspection and acceptance of the deliverable items to be furnished hereunder shall be made by the NRC Contracting Officer's Representative (COR) at the destination, accordance with FAR 52.247-34 - F.o.b. Destination.

Contract Deliverables:

1. See Attachment 1 "Statement of Work" - Section 6 "Deliverables and Delivery Schedule"

(End of Clause)

A.20 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 GS23F0110M - NRC-HQ-60-15-A-0001 - 31310019F0039.

(End of Clause)

A.21 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.

(End of Clause)

A.22 List of Documents, Exhibits, and Other Attachments

Attachment Number	Title	Date	Number of Pages
1	STATEMENT OF WORK	09/09/19	7
2	NRC FORM 187 – CONTRACT SECURITY AND/OR CLASSIFICATION REQUIREMENTS	09/05/2019	4

TRACE Plant Model Development and Maintenance in Anticipation of New Rulemaking and Exploratory Simulations

Contents

- B.1 Title of Project
- B.2 Background
- B.3 Scope of Work
- B.4 Applicable Documents and Standards
- B.5 Specific Tasks and Level of Effort
- B.6 List of Services/Deliverables
- B.7 Reporting Requirements
- B.8 Required Labor Categories
- B.9 Government-Furnished Property
- B.10 License Fee Recoverable
- B.11 Place of Performance
- B.12 Travel
- B.13 Security

B.1 PROJECT TITLE

TRACE Plant Model Development and Maintenance in Anticipation of New Rulemaking and Exploratory Simulations

B.2 BACKGROUND

One of the mission directives of the U.S. Nuclear Regulatory Commission's (NRC's), Office of Nuclear Regulatory Research (RES) is to provide the appropriate analytical tools for identifying and resolving safety issues. In the area of reactor thermal hydraulics, RES has developed and maintains the TRAC/RELAP Advanced Computational Engine (TRACE) along with a collection of plant models in native TRACE format to perform a range of thermal-hydraulic analyses. These analyses include confirmatory calculations related to design certifications and the auditing of justifications provided by licensees seeking licensing amendments. Taken together, the latest version of TRACE and a full complement of plant input models gives the agency more agility to respond to new rulemaking, exploratory simulations, or any other emergent thermal-hydraulic analytical need.

Over the past decade, a number of steps have been taken to make TRACE and the assortment of input models a more viable analysis tool. TRACE has evolved, through a series of code versions, to expand its applicability and to become more accurate and robust. In conjunction with that evolution, 16 plant models were developed that represent most of the different types of nuclear steam supply systems (NSSS) and containment designs currently in operation. More recently, the TRACE Pressurized Water Reactor (PWR) Modeling Guidelines were developed to foster some standardization in plant-model construction and thereby reduce modeling errors made by TRACE users.

As a result of the past efforts, the use of TRACE and the collection of plant models has increased significantly and has played a vital role in ensuring reactor safety. However, more plant-model development and plant-model maintenance are necessary to fortify the TRACE plant-model collection. With respect to model development, plant models that represent the NSSS and containment designs missing from the plant-model collection must be developed. The decks currently missing from the collection include a variety of plants across the five BWR product lines and a raised-loop Babcock & Wilcox (B&W).

Maintenance of the plant models that are currently in the collection is necessary because all of those models were developed using modeling practices and component nodalizations considered appropriate for a particular code version. With the continued enhancement of TRACE over the years, there has been a departure from some of the modeling practices and components that were previously proposed. Therefore, the currently available plant models, along with the

corresponding documentation, must be updated in accordance with the latest TRACE PWR Modeling Guidelines, which corresponds with TRACE Patch 4.

B.3 SCOPE OF WORK

The contractor shall provide technical assistance in the updating, verifying, and documenting of the TRACE models for Oconee Unit 1, Palo Verde Unit 1, and Point Beach Unit 1.

The Oconee, Palo Verde, and Point Beach TRACE models shall be updated in accordance with the latest version of the TRACE PWR Modeling Guidelines. All models shall be verified by performing steady-state and transient calculations, and the modeling details and simulation results for each model shall be documented in a calculation notebook and analysis report, respectively.

B.4 APPLICABLE DOCUMENTS AND STANDARDS

The following guidance and reports are applicable to this task order and will be provided to the contractor by the Contracting Officer's Representative (COR).

Applicable documents include the following:

- TRACE PWR User Guidelines (Rev.1)
- TRACE Theory Manual Patch V
- TRACE User's Manual Patch V
- Oconee Updated Final Safety Analysis Report (UFSAR) (Rev.22)
- Palo Verde UFSAR (Rev. 16)
- Point Beach UFSAR (Rev. 12)

B. 5 SPECIFIC TASKS AND LEVEL OF EFFORT

Task 1: Update the Oconee TRACE Model and Develop Corresponding Calculation Notebook

Task 1.1 Update Oconee TRACE Model

The contractor shall use the latest version of SNAP, an applicable version of TRACE (Version 1175 or later), and any available sources of Oconee-specific or relatable plant information to assemble a complete base Oconee TRACE model and two transient restart cases. The base model shall adhere to the latest TRACE PWR User Guidelines and contain the requisite nodalization, input specifications, and intended functionality. The restart cases shall be loss-of-coolant accidents (LOCAs), one a

large-break LOCA (LBLOCA) and the other a spectrum of small-break LOCA (SBLOCA) cases, each of which are to be developed as separate cases using the graphical editing mode in Symbolic Nuclear Analysis Package (SNAP). The SBLOCA spectrum shall be configured as a single case that includes eight break sizes: 2, 2.5, 3, 3.5, 4, 4.5, 5, and 6 inches. If accuracy or robustness issues arise, alternative modeling methods may be explored after consultation with the NRC COR.

The contractor shall perform demonstration calculations to verify the inputs and demonstrate the operability of the base-model steady state and the LOCA models. The results from these demonstration calculations shall be documented in an analysis report. For the SBLOCA spectrum, the analysis shall focus on the break sizes that yield the most limiting results.

Task 1.2 Develop a Calculation Notebook for the Oconee TRACE Model

The contractor shall use all available plant information to create a separate, stand-alone calculation notebook that completely describes the Oconee TRACE model. The notebook shall be structured in a manner similar to the Vogtle Calculation Notebook, such that there is a graphical depiction of each major component showing the relevant dimensions and that there is sufficient text to describe all modeling assumptions, the rationale behind input-parameter selections, and the sources of all plant-model input. The notebook shall include all information necessary to assemble the Oconee model, to include the modifications made to bring the model into compliance with the TRACE PWR User Guidelines.

Deliverables: The contractor shall provide a single SNAP (*.med) file that contains the base Oconee TRACE model and the two transient cases as described above, along with the corresponding calculation notebook and analysis report.

Estimated level of total effort for task order period: 1,100 staff-hours

Task 2: Update the Palo Verde Unit 1 TRACE Model and Develop a Corresponding Calculation Notebook that Describes Both

Task 2.1 Develop TRACE Model for Palo Verde Unit 1

The contractor shall modify each component, control system, and boundary condition currently employed in the Palo Verde TRACE model to produce a complete, base Palo Verde model and two transient restart cases that adhere to the latest TRACE PWR User Guidelines. The base

ATTACHMENT 1 – STATEMENT OF WORK

model shall contain the requisite nodalization, input specifications, and intended functionality. The restart cases shall be loss-of-coolant accidents (LOCAs), one a large-break LOCA (LBLOCA) and the other a spectrum of small-break LOCA (SBLOCA) cases, each of which are to be developed as separate cases using the graphical editing mode in SNAP. The SBLOCA spectrum shall be configured as a single case that includes eight break sizes: 2, 2.5, 3, 3.5, 4, 4.5, 5, and 6 inches. If accuracy or robustness issues arise, alternative modeling methods may be explored after consultation with the NRC COR.

The contractor shall perform demonstration calculations to verify the inputs and demonstrate the operability of the base-model steady state and the LOCA models. The results from these demonstration calculations shall be documented in an analysis report. For the SBLOCA spectrum, the analysis shall focus on the break sizes that yield the most limiting results.

Task 2.2 Develop a Calculation Notebook for the Palo Verde TRACE Model

The contractor shall use all available plant information to create a separate, stand-alone calculation notebook that completely describes the Palo Verde TRACE model. The notebook shall be structured in a manner similar to the Vogtle Calculation Notebook, such that there is a graphical depiction of each major component showing the relevant dimensions and that there is sufficient text to describe all modeling assumptions, the rationale behind input-parameter selections, and the sources of all plant-model input. The notebook shall include all information necessary to assemble the Palo Verde model, to include the modifications made to bring the model into compliance with the TRACE PWR User Guidelines.

Deliverables: The contractor shall provide a single SNAP (*.med) file that contains the base Palo Verde TRACE model and the two transient cases as described above, along with the corresponding calculation notebook and analysis report.

Estimated level of total effort for task order period: 1,100 staff-hours

Task 3: Update the Point Beach TRACE Model and Develop Corresponding Calculation Notebook**Task 3.1 Update Point Beach TRACE Model**

The contractor shall modify each component, control system, and boundary condition currently employed in the Point Beach TRACE model

to produce a complete, base Point Beach model and two transient restart cases that adhere to the latest TRACE PWR User Guidelines. The base model shall contain the requisite nodalization, input specifications, and intended functionality. The restart cases shall be loss-of-coolant accidents (LOCAs), one a large-break LOCA (LBLOCA) and the other a spectrum of small-break LOCA (SBLOCA) cases, each of which are to be developed as separate cases using the graphical editing mode in SNAP. The SBLOCA spectrum shall be configured as a single case that includes eight break sizes: 2, 2.5, 3, 3.5, 4, 4.5, 5, and 6 inches. If accuracy or robustness issues arise, alternative modeling methods may be explored after consultation with the NRC COR.

The contractor shall perform demonstration calculations to verify the inputs and demonstrate the operability of the base-model steady state and the LOCA models. The results from these demonstration calculations shall be documented in an analysis report. For the SBLOCA spectrum, the analysis shall focus on the break sizes that yield the most limiting results.

Task 3.2 Develop a Calculation Notebook for the Point Beach TRACE Model

The contractor shall use all available plant information to create a separate, stand-alone calculation notebook that completely describes the Point Beach TRACE model. The notebook shall be structured in a manner similar to the Vogtle Calculation Notebook, such that there is a graphical depiction of each major component showing the relevant dimensions and that there is sufficient text to describe all modeling assumptions, the rationale behind input-parameter selections, and the sources of all plant-model input. The notebook shall include all information necessary to assemble the Point Beach model, to include the modifications made to bring the model into compliance with the TRACE PWR User Guidelines.

Deliverables: The contractor shall provide a single SNAP (*.med) file that contains the base Point Beach TRACE model and the two transient cases as described above, along with the corresponding calculation notebook and analysis report.

Estimated level of total effort for task order period: 1,100 staff-hours

B.6 DELIVERABLES AND DELIVERY SCHEDULE*Table 1 Deliverables*

Tasks	Delivery Dates		Deliverables
	Preliminary Deliverables	Final Deliverables	
Task 1	5 months after receipt of requisite information from NRC COR	2 months after receipt of NRC comments on draft deliverables, but no later than the last date of the period of performance.	The contractor shall provide the TRACE plant model for Oconee and corresponding calculation notebook and analysis report for review and comment after the delivery of preliminary and final deliverables.
Task 2	6 months after receipt of requisite information from NRC COR	2 months after receipt of NRC comments on draft deliverables, but no later than the last date of the period of performance.	The contractor shall provide the TRACE plant models for Palo Verde, along with corresponding calculation notebook and analysis report, for review and comment after the delivery of preliminary and final deliverables.
Task 3	7 months after receipt of requisite information from NRC COR	2 months after receipt of NRC comments on draft deliverables, but no later than the last date of the period of performance.	The contractor shall provide the TRACE plant model for Point Beach and corresponding calculation notebook and analysis report for review and comment after the delivery of preliminary and final deliverables.
Monthly Letter Status Report	20th of the following month	N/A	Monthly Letter Status Report (MLSR) per Section A.5.10 of the Base BPA

B.7 REPORTING REQUIREMENTS**Monthly Letter Status Report (MLSR)**

Each month, the contractor will provide a Monthly Letter Status Report (MLSR) per Section A.5.10 of the Base BPA. This report is due no later than the 20th of the following month. If no work was performed during the prior month, the contractor

shall not prepare and submit an MLSR. Copies of the MLSRs are to be sent to the COR the Alternate COR with a copy provided to the Contracting Officer.

B.8 REQUIRED LABOR CATEGORIES

The Contractor shall provide individuals who have the required educational background and work experience to meet the objectives of the work specified in this task order. Specific qualifications for this work include the following:

Executive

The Executive must have an engineering degree, at least 20 years of experience in nuclear reactor system design and accident analysis, and at least 10 years of experience in managing and successfully completing projects requiring the development of TRACE models for nuclear power plants and the use of those models to conduct accident analyses.

Corporate Engineer

The Corporate Engineer must have an engineering degree, at least 15 years of experience in nuclear reactor system design and accident analysis, and at least eight years of experience in TRACE model development.

Senior Engineer

The Senior Engineer must have an engineering degree, at least eight years of experience in nuclear reactor system design and accident analysis, and at least five years of experience in TRACE model development.

B.9 GOVERNMENT-FURNISHED PROPERTY

The NRC COR will provide the Contractor with the following:

- Palo Verde TRACE Model
- Point Beach TRACE Model
- TRACE 5.1200 and applicable upgrades
- SNAP Version 2.6.2 or later

B.10 LICENSE FEE RECOVERABLE

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

B.11 PLACE OF PERFORMANCE

All work shall be performed at the contractor's site.

B.12 TRAVEL

No travel is anticipated for this task order.

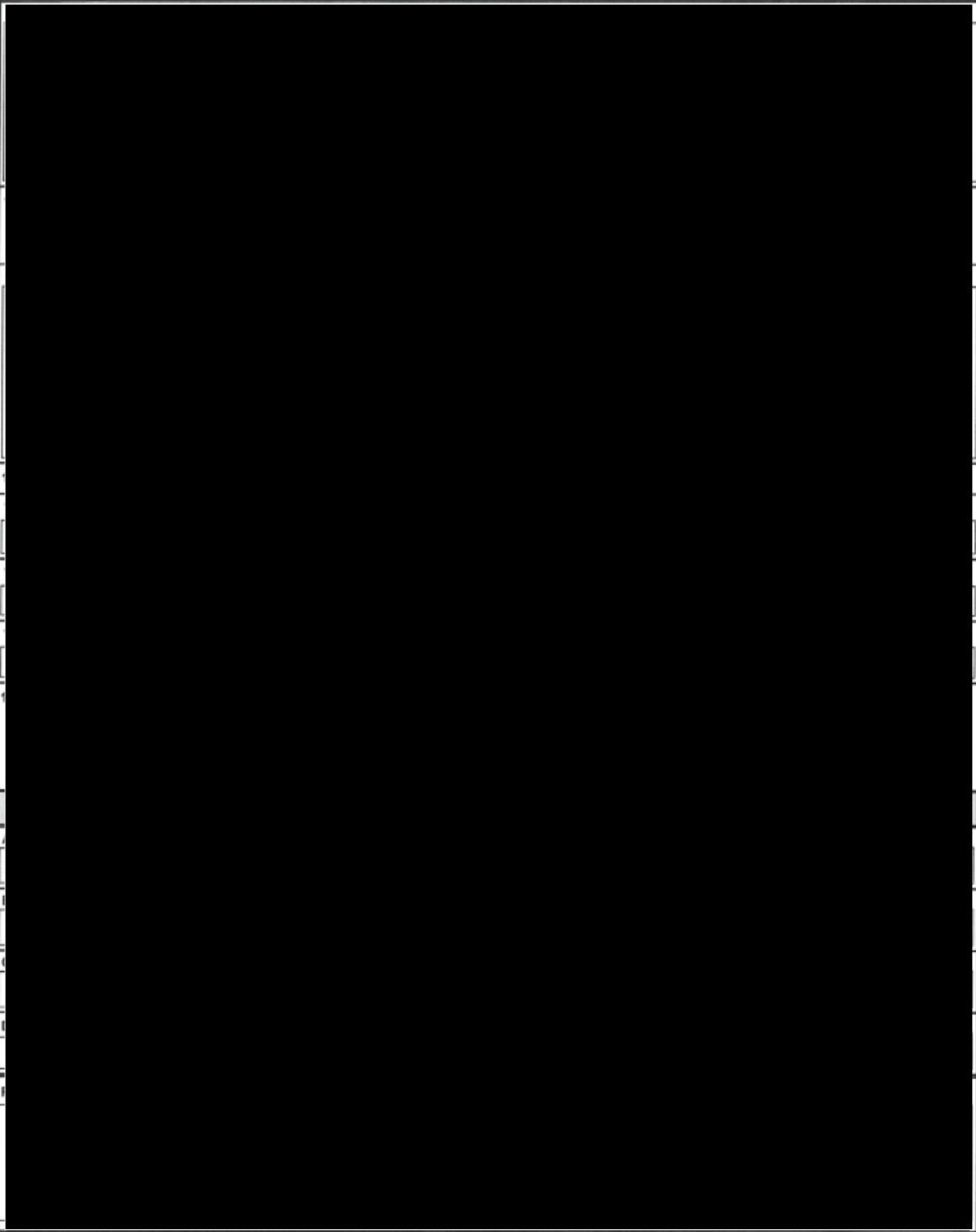
B.13 SECURITY

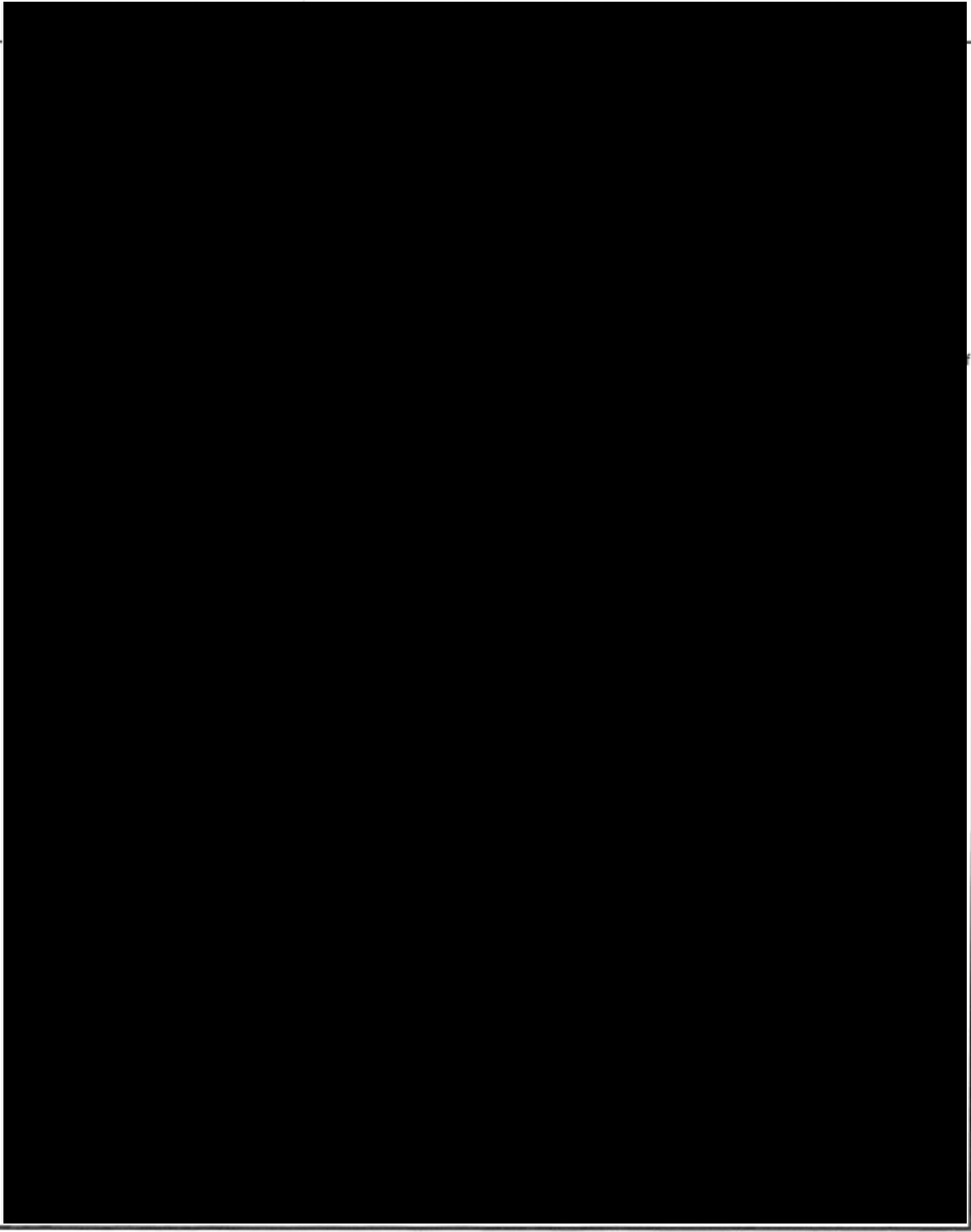
All work related to this task order shall be PROPRIETARY. The contractor shall safeguard documents containing proprietary information against unauthorized disclosure. After completion of work, the contractor must either destroy the documents or return them to the NRC. If they are destroyed, please confirm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

NRC FORM 187 (04-2019) NRCMD 12		CONTRACT SECURITY AND/OR CLASSIFICATION REQUIREMENTS	U.S. NUCLEAR REGULATORY COMMISSION
			

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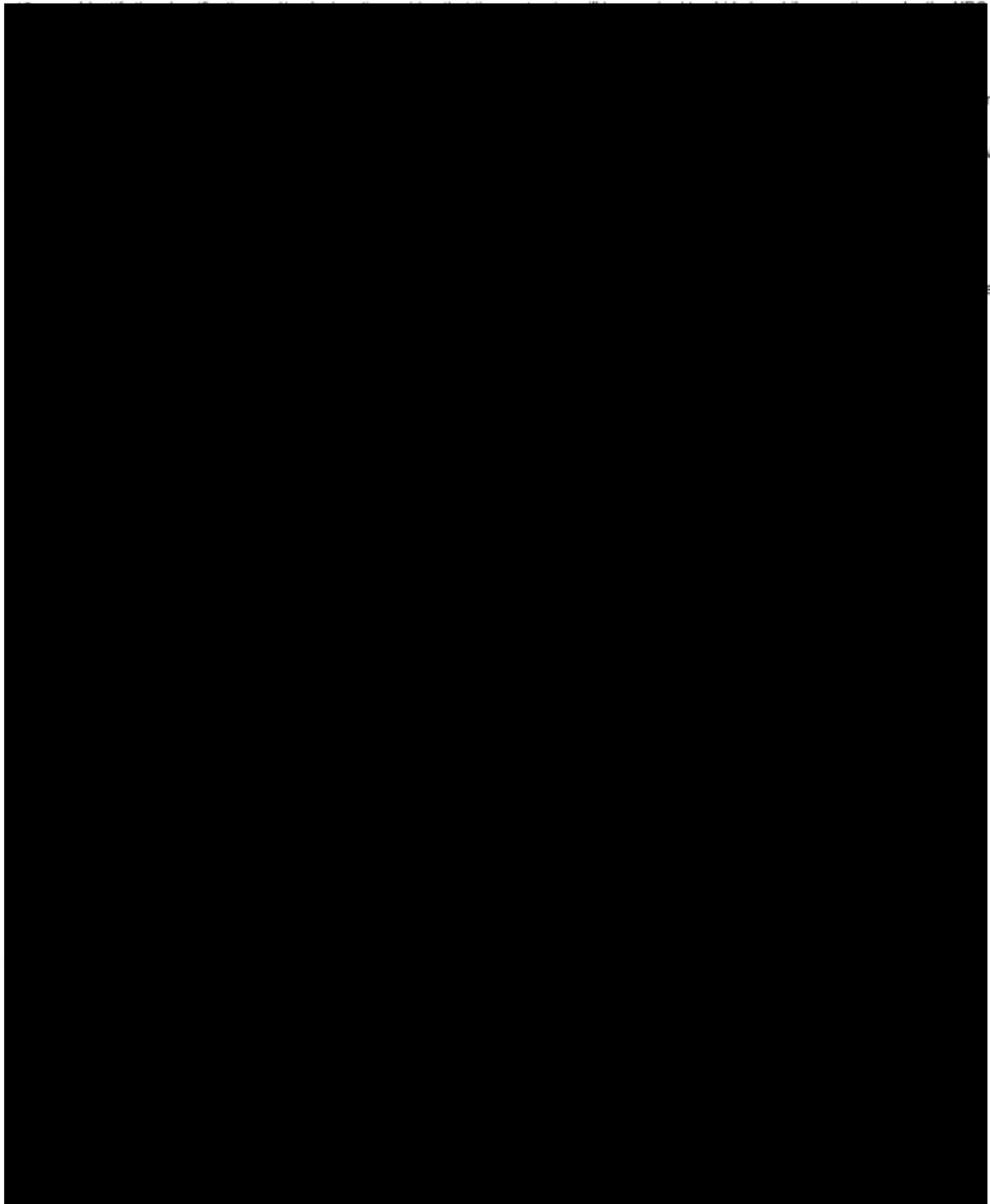
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