AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES
	1 3

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
M0010	See Block 16C	NRO-17-0031	

6. ISSUED BY CODE NRCHQ

US NRC - HQ
ACQUISITION MANAGEMENT DIVISION
MAIL STOP TWFN-5E03
WASHINGTON DC 20555-0001

7. ADMINISTERED BY *(If other than Item 6)* CODE

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and ZIP Code)*

S W R I
ATTN PAUL MALDONADO
6220 CULEBRA RD
SAN ANTONIO TX 782385166

CODE 007936842 FACILITY CODE

(x) 9A. AMENDMENT OF SOLICITATION NO.

9B. DATED *(SEE ITEM 11)*

x 10A. MODIFICATION OF CONTRACT/ORDER NO.
NRC-HQ-50-14-E-0001
NRC-HQ-25-15-T-0001

10B. DATED *(SEE ITEM 13)*
08/27/2015

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

12. ACCOUNTING AND APPROPRIATION DATA *(If required)* Net Increase: $70,000.00
2017-X0200-FEEBASED-25-25D005-1062-11-4-212-251A-11-4-212-1062

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

CHECK ONE	
	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
X	D. OTHER *(Specify type of modification and authority)* 52.243-2 CHANGES - COST REIMBURSEMENT

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

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

The purpose of this modification is to: 1. revise the statement of work (SOW) to increase the level of effort thereby increasing the task order ceiling by $115,652.00 from $669,983.00 to $785,635.00, 2. obligate funds in the amount of $70,000.00, thereby increasing the total obligated amount from $669,983.00 to $739,983.00, and 3. extend the period of performance through September 30, 2018.

Accordingly,

1.The attached Statement of Work (SOW) titled "NRC-HQ-25-15-T-0001 M0010 SOW" hereby replaces Section C, Descriptions/Specifications/Statement of Work under this task order.

Continued ...

Except as provided herein, all terms and conditions of the document referenced in Item 9 A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*	16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*
R.B. Kalmbach Executive Director, Contracts	SHARLENE M. MCCUBBIN

15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
(Signature of person authorized to sign)	26 Jun 2017	— *(Signature of Contracting Officer)* Digitally signed by Sharlene M. McCubbin DN: c=US, o=U.S. Government, ou=U.S. Nuclear Regulatory Commission, ou=NRC-PIV, cn=Sharlene M. McCubbin, 0.9.2342.19200300.100.1.1=2000002241 Date: 2017.07.01 14:29:21 -04'00'	

NSN 7540-01-152-8070
Previous edition unusable

STANDARD FORM 30 (REV. 10-83)
Prescribed by GSA
FAR (48 CFR) 53.243

NAME OF OFFEROR OR CONTRACTOR
S W R I

ITEM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
	Therefore, the base and exercised options and base and all options are increased by $115,652.00 from $669,983.00 to $785,635.00. Accordingly, paragraph (a) under section NRCB040, CONSIDERATION AND OBLIGATION – COST-PLUS-FIXED-FEE ALTERNATE I, is revised to read as follows: "(a) The total estimated cost to the Government for full performance of this contract is $785,635.00 of which the sum of [redacted] represents the estimated reimbursable costs, and of which [redacted] represents the fixed-fee." Also, paragraph (a) under section 2052.215-78 TRAVEL APPROVALS AND REIMBURSEMENT(OCT 1999) - ALTERNATE I (OCT 1999), is revised to read as follows: "(a) Total expenditure for travel may not exceed $20,848.00 without the prior approval of the contracting officer." 2. Incremental funds in the amount of $70,000.00 are obligated, thereby increasing the total obligated funds from $669,983.00 to $739,983.00. Accordingly, paragraph (c) under section NRCB040, CONSIDERATION AND OBLIGATION – COST-PLUS-FIXED-FEE ALTERNATE I, is revised to read as follows: "(c) The amount currently obligated by the Government with respect to this contract is $739,983.00, of which the sum of [redacted] represents the estimated reimbursable costs, and of which [redacted] represents the fixed-fee." 3. The period of performance is hereby extended through September 30, 2018. Accordingly, section NRCF032, TASK/DELIVERY ORDER PERIOD OF PERFORMANCE (SEP 2013), is revised to read as follows: "This order shall commence on September 1, 2015 and will expire on September 30, 2018." All other terms and conditions remain unchanged. Total Obligated Amount: $739,983.00 (Changed) Continued ...				

NAME OF OFFEROR OR CONTRACTOR

S W R I

ITEM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
	Base and Exercised Options: $785,635.00 (Changed) Base and All Options: $785,635.00 (Changed) Period of Performance: 09/01/2015 to 09/30/2018				

M0010 Attachment No. 1

Task Order Statement of Work
for
"Support to NRC Staff for Seismic Hazard Reviews at Three Western U.S. Nuclear Power Plant Sites, Probabilistic Seismic Hazard Analysis Software Modification, and Stakeholder and Public Outreach Meetings"

1. PROJECT TITLE DESCRIPTION

The objective of this task order is to acquire technical expertise from CNWRA for supporting NRC staff efforts in the following activities: (1) Completing reviews of Seismic Source Characterization (SSC) reports and Seismic Hazard and Screening Reports (SHSRs) submitted by three Western United States (WUS) licensees in response to the 10 CFR 50.54(f) information request; (2) Modifying Probabilistic Seismic Hazard Analysis (PSHA) software for use by NRC staff in assessing SHSRs from licensees; and (3) Preparing summary materials for public distribution and planning and conducting stakeholder and public outreach meetings.

2. BACKGROUND

To address lessons learned from the accident at the Fukushima Dai-ichi Nuclear Power Plant caused by the March 2011 Tohoku earthquake and subsequent tsunami, the Commission established a Near-Term Task Force (NTTF) to conduct a systematic review of U.S. Nuclear Regulatory Commission (NRC) processes and regulations and to determine if the NRC should make additional improvements to its regulatory framework. The NTTF developed a set of recommendations intended to clarify and strengthen the regulatory framework for protection against natural hazards. NTTF Recommendation 2.1, as amended by staff requirements memoranda associated with SECY-11-0124 and SECY-11-0137, instructs NRC staff to issue a request for information to licensees pursuant to Sections 161.c, 103.b, and 182.2 of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f). This information request is for licensees and holders of construction permits under 10 CFR Part 50 to reevaluate seismic hazards at their sites against current NRC requirements and guidance. Based on the information provided by the licensees, NRC staff will determine whether additional regulatory actions are necessary (e.g., updating of the design basis and structures, systems, and components important to safety) to protect against the reevaluated hazards.

In accordance with the 10 CFR 50.54(f) information request, licensees of plants located in the WUS should develop an updated, site-specific probabilistic seismic hazard assessment (PSHA) to characterize seismic hazard for their sites. Consistent with Regulatory Guide (RG) 1.208, "A Performance-Based Approach to Define the Site Specific Earthquake Ground Motion," licensees should use a Senior Seismic Hazard Analysis Committee (SSHAC) study as described in NUREG/CR-6372, "Recommendations for Probabilistic Seismic Hazard Analysis: Guidance on Uncertainty and Use of Experts." Consistent with current practice as described in NUREG-2117, "Practical Implementation Guidelines for SSHAC Level 3 and 4 Hazard Studies," a SSHAC Level 3 study should be performed.

To implement NTTF Recommendation 2.1, the staff has defined a process that asks each licensee to provide information about the current hazard and potential risk posed by seismic

events. Depending on results of the comparison between the reevaluated seismic hazard and the current design basis, licensees will perform a further seismic risk evaluation, if necessary. Risk evaluation approaches acceptable to the staff include a seismic probabilistic risk assessment (SPRA) or a seismic margin assessment (SMA).

In addition, the NRC performs confirmatory calculations as part of the safety assessment for existing and proposed nuclear facilities. Current regulatory requirements and guidance specify that the seismic safety of these facilities should be evaluated using PSHA as input for development of seismic loads. Seismic source characterization models are to be used with the latest ground motion prediction models to produce robust and consistent estimates of seismic hazards and loads at nuclear facilities. The NRC, the U.S. Department of Energy (DOE), and the Electric Power Research Institute (EPRI) have co-sponsored a project to develop a state-of-the-art SSC model for the central and eastern United States (CEUS), which is referred to as the CEUS-SSC model. This model is to be used with the latest ground motion prediction models to produce robust estimates of seismic hazards and loads at nuclear facilities in the CEUS.

The CEUS-SSC model, as well as models being developed for WUS nuclear power plants, follows the guidance on incorporating uncertainty contained in NUREG/CR-6372. This document, referred to as the SSHAC guidelines, provides a framework for incorporating expert elicitations and considering uncertainty in the conduct of large PSHA studies. The explicit incorporation of scientific or epistemic uncertainty into the SSC model results in a final logic model with a high degree of complexity, which will require very specific software to produce robust results.

Recognizing the importance of PSHA in the seismic design of critical facilities, the Pacific Earthquake Engineering Research Centre (PEER) Lifelines Program sponsored a working group, comprised of code developers from Government agencies and engineering firms, to verify both the numerical approaches and the computer software codes used in PSHA. This effort, the first and only of its kind to date, provided for a comprehensive structured verification of PSHA software and included all available major software codes. The focus of the effort was the numerical verification of the PSHA codes and analysis and comparison of the various features of the codes. The working group was able to produce consistent results within acceptable tolerance limits for the simple test cases run in this verification exercise. It is imperative to produce consistent results for individual cases since the final hazard estimate for a given site will be a summation of results from many thousands of individual cases. Any PSHA software used by the NRC in regulatory decision-making must have been validated by the PEER Lifelines Program.

The Center for Nuclear Waste Regulatory Analyses (CNWRA) has access to technical specialists with the appropriate expertise for supporting NRC staff in review of PSHA reports submitted by WUS licensees in response to the 10 CFR 50.54(f) information request related to seismic hazard and associated risk evaluations; modification of PSHA software for use by NRC staff in assessment of PSHA reports; preparing summary materials for public distribution and planning and conducting stakeholder and ~~development and conduct of~~ public outreach meetings.

3. SCOPE OF WORK

The scope of work comprises the following three primary tasks:

Task 1 – The contractor shall support NRC staff in completing reviews of SSC reports and SHSRs submitted by WUS licensees for nuclear power plants at Diablo Canyon (CA), the Columbia Generating Station (WA), and Palo Verde (AZ) in response to the 10 CFR 50.54(f) information request. This support shall include providing draft inputs to the Staff Assessment (SA) report for each plant.

Task 2 – The contractor shall modify PSHA software for use by NRC staff in assessing SHSRs from licensees and shall develop control point ("soil") hazard curves consistent with "Method 3" as described in NUREG/CR-6728.

Task 3 – The contractor shall support NRC staff in preparing summary materials for public distribution and planning and ~~developing and~~ conducting stakeholder and public outreach meetings, as requested. To enhance transparency of the information presented in the Staff Assessments (SAs) developed for the seismic hazard reevaluations performed by the NRC, the contractor shall assist the NRC with preparing a NUREG containing additional plant-by-plant data related to the staff's site hazard and site response analyses. Specifically, the contractor shall provide support to the NRC by developing assigned sections of NUREG text, providing technical review of NUREG sections, and assisting with formatting the NUREG to camera-ready publications standards.

4. DETAILED TASK DESCRIPTIONS

Detailed descriptions of the work to be performed under Tasks 1, 2, and 3 are as follows:

Task 1 – Support NRC staff in completing reviews of SSC reports and SHSRs submitted by WUS licensees for Diablo Canyon (CA), the Columbia Generating Station (WA), and Palo Verde (AZ) in response to the 10 CFR 50.54(f) information request.

This task comprises the following activities, some of which have been completed:

Task 1a: Assist with review of SSC reports and SHSRs for the Diablo Canyon nuclear power plant in California.

Task 1a(i) COMPLETED: Complete the technical assessment of the Pacific Gas and Electric Co. (PG&E) onshore and offshore seismic imaging data, earthquake data, potential field data (magnetic and gravity), and geologic mapping information. The assessments will be used to evaluate the data within the range of technical interpretations provided by PG&E in their updated PSHA SSC report and to test the sensitivity of alternative interpretations of these data on the PSHA results. The contractor will work closely with the NRC COR and Technical Monitor to ensure that the evaluations focus on those interpretations of geologic and geophysical data deemed most significant to seismic hazard. Evaluation of the range of plausible interpretations for fault slip-rate on seismic sources closest to the plant site will be of critical importance.

Task 1a(ii) COMPLETED: Using the Petrel E&P software platform, develop a three dimensional digital model of seismic velocity data (P-wave and S-wave data) collected by PG&E at the plant site. The model will be used to derive

random profiles of V_S and V_P to support confirmatory analysis of the PG&E site response information to be performed by NRC staff.

Task 1a(iii) COMPLETED: Complete review of the SSC reports and SHSRs for Diablo Canyon after the activities defined above are finished, including sensitivity studies, if deemed necessary.

Task 1a(iv) COMPLETED: Assist with preparation of requests for additional information (RAIs) for Diablo Canyon.

Task 1a(v) COMPLETED: Assist with review of RAI responses for Diablo Canyon.

Task 1a(vi) COMPLETED:Prepare input for the final SA report, including participation in writing sessions for that report as requested.

Task 1a(vii): Provide continued technical support to NRC staff for Diablo Canyon, if requested, for stakeholder and ~~for~~ public outreach activities.~~,~~

Task 1b: Assist with review of SSC reports and SHSRs for the Columbia Generating Station (CGS) nuclear power plant in Washington.

Task 1b(i) COMPLETED: Complete review of the SSC reports and SHSRs for CGS, including sensitivity studies, if deemed necessary.

Task 1b(ii) COMPLETED: Assist with preparation of requests for additional information (RAIs) for CGS.

Task 1b(iii) COMPLETED: Assist with review of RAI responses for CGS.

Task 1b(iv) COMPLETED: Prepare input for the final SA report, including participation in writing sessions for that report as requested.

Task 1b(v): Provide continued technical support to NRC staff for CGS, if requested, for stakeholder and public outreach activities.

Task 1c: Assist with review of SSC reports and SHSRs for the Palo Verde nuclear power plant in Arizona.

Task 1c(i) COMPLETED: Complete review of the SSC reports and SHSRs for Palo Verde, including sensitivity studies and analysis of the earthquake catalog, if deemed necessary.

Task 1c(ii) COMPLETED: Assist with preparation of requests for additional information (RAIs) for Palo Verde.

Task 1c(iii) COMPLETED: Assist with review of RAI responses for Palo Verde.

Task 1c(iv) COMPLETED: Prepare input for the final SA report, including participation in writing sessions for that report as requested.

Task 1c(v): Provide continued technical support to NRC staff for Palo Verde, if requested, for stakeholder and public outreach activities.

Task 2 – The contractor shall modify PSHA software for use by NRC staff in assessing SHSRs from licensees and provide all resources necessary to develop software and analysis tools as defined in this SOW, except for those items specified as Government-furnished property and services. The contractor shall work closely with the NRC COR and Technical Monitor during testing and confirmation of the PSHA software to ensure that it meets the technical and functional specifications necessary for NRC staff to conduct confirmatory analyses. The software shall be capable of producing probabilistic seismic hazard estimate at arbitrary locations in the U.S. For sites in the CEUS, the software shall use the CEUS-SSC model and the most recent CEUS ground motion prediction models endorsed by the NRC (EPRI Report No. 3002000717, 2013). For sites in the WUS, the software shall use site-specific seismic source models and the latest ground motion prediction equations (i.e., NGA-West 2, Southwestern U.S., or Hanford/Columbia).

This task comprises the following activities, some of which have been completed:

Task 2a COMPLETED: Modify the PSHA codes currently used by NRC staff (i.e., probhaz_NRC, faulthaz_NRC, and probhaz_CEUSSSC) such that the codes use the latest ground motion prediction models stated above.

Task 2b COMPLETED: Support the continuing use of the PSHA codes listed under Task 2a in the PEER PSHA code validation project.

Task 2c: Develop batch scripts such that the PSHA codes listed above can produce uncertainty estimates ("fractile curves") for ground motion hazard.

Task 2d COMPLETED: Modify the codes to produce soil hazard curves consistent with "Method 3" as described in NUREG/CR-6728.

Task 2e: Develop documentation for the codes and associated batch scripts and provide training on the codes for NRC staff.

Task 2f: Modify NRC code "probhaz_CEUSSSC" to facilitate validation and comparison with hazard results obtained from the USGS 2014 seismic hazard model.

Task 3 – Support NRC staff in preparing summary materials for public distribution and planning and ~~developing~~ and conducting stakeholder and public outreach meetings, ~~if~~ as requested.

This task comprises the following activities:

Task 3a: Assist with developing plain language summaries, ~~and~~ fact sheets and Q & As related to technical information resulting from work performed under Task 1, if requested. ~~.~~

Task 3b: Assist ~~with Q & A development.~~with organizing, preparing for, and facilitating stakeholder and public outreach meetings to discuss technical information resulting from work performed under Task 1, if requested.

Task 3c: Assist with ~~organizing and preparing for stakeholder and public outreach meetings.~~ developing responses to public comments resulting from stakeholder and public outreach meetings held to discuss technical information resulting from work performed under Task 1, if requested.

Task 3d: ~~Attend and assist with facilitation of public outreach meetings.~~Assist with developing assigned sections of the NUREG containing additional plant-by-plant information on the site hazard and site response analyses performed by staff for the seismic hazard reevaluations.

Task 3e: ~~Assist with developing responses to public letters and comments.~~ Review and provide comments on the draft NUREG containing additional plant-by-plant information on the staff's site hazard and site response analyses for incorporation into the final NUREG.

Task 3f: Assist with preparing the final NUREG formatted to camera-ready publication standards.

The NRC COR may issue technical direction during the duration of the task order, but it must be within the scope of the SOW and shall not constitute new assignments of work or changes to the work that result in an adjustment in cost or period of performance under the contract. Any modifications to the scope of work, cost, or period of performance of the task order must be issued by the Contracting Officer and coordinated with the Project Officer.

5. DELIVERABLES AND DELIVERY SCHEDULE

The contractor shall provide deliverables in Microsoft® Word format, unless other software is approved in writing by the NRC COR. Deliverables shall be provided to the NRC COR in electronic format. Unless the contract is otherwise bilaterally modified by both the contractor and the NRC, the contractor shall submit deliverables by the due dates shown in the deliverables schedule table below. When mutually agreed upon by the contractor and NRC COR, the contractor may submit preliminary or partial drafts to ensure full understanding of the work requirements.

Deliverables Schedule For Task 1

Deliverable	Description	Quantity/Media	Date To Be Completed
Task 1a(i)	Diablo Canyon – Complete technical assessment of PG&E onshore and offshore seismic imaging data, earthquake data, gravity and magnetic potential field data, and geologic mapping data; and evaluate these data in regard to the range of technical interpretations provided by PG&E in the SSC reports and SHSRs.	Draft electronic reports in Microsoft® Word summarizing results of the data assessments and evaluations.	COMPLETED
Task 1a(ii)	Diablo Canyon – Develop 3D model of seismic velocity data	3D model and all necessary documentation	COMPLETED
Task 1a(iii)	Diablo Canyon – Complete review of the SSC reports and SHSRs.	Draft electronic report in Microsoft® Word summarizing results of the review.	COMPLETED
Task 1a(iv)	Diablo Canyon - Assist with preparation of RAIs	Draft RAIs	COMPLETED
Tasks 1a(v)	Diablo Canyon - Review of RAI responses	Review RAI responses	COMPLETED
Task 1a(vi)	Diablo Canyon - Provide input for the final SA report, including participation in writing sessions as well as review of the report, if requested	Input to the final SA report and review of the report	COMPLETED
Task 1a(vii)	Diablo Canyon - Provide continued technical support to NRC staff for Diablo Canyon, if requested, for stakeholder and public outreach activities.	Continued technical support for Diablo Canyon	~~09/30/2017~~ TBD
Task 1b(i)	Columbia – Complete review of the SSC reports and SHSRs.	Draft electronic report in Microsoft® Word summarizing results of the review and any sensitivity studies performed.	COMPLETED
Task 1b(ii)	Columbia - Assist with preparation of RAIs	Draft RAIs	COMPLETED
Task 1b(iii)	Columbia - Review of RAI responses	Review RAI responses	COMPLETED
Task 1b(iv)	Columbia – Provide input for the final SA report, including participation in writing sessions as well as review of the report, if requested.	Input to the final SA report and review of the report	COMPLETED
Task 1b(v)	Columbia - Provide continued technical support to NRC staff for CGS, if requested. for stakeholder and public outreach activities.	Continued technical support for CGS	~~09/30/2017~~ TBD
Task 1c(i)	Palo Verde – Complete review of the SSC reports and SHSRs for Palo Verde.	Draft electronic report in Microsoft® Word summarizing results of the review and any	COMPLETED

		sensitivity studies or analysis of the earthquake catalog.	
Task 1c(ii)	Palo Verde - Assist with preparation of RAIs	Draft RAIs	COMPLETED
Task 1c(iii)	Palo Verde - Review of RAI responses	Review RAI responses	COMPLETED
Task 1c(iv)	Palo Verde – Provide input to the final SA report, including participation in writing sessions as well as review of the report, if requested	Input to the final SA report and review of the report	COMPLETED
Tasks 1c(v)	Palo Verde - Provide continued technical support to NRC staff for Palo Verde, if requested, for stakeholder and public outreach activities.	Continued technical support for Palo Verde	~~09/30/2017~~ TBD

2

Deliverables Schedule For Task 2

Deliverable	Description	Quantity/Media	Date To Be Completed
Task 2a	Complete modifications of PSHA codes used by NRC staff (i.e., probhaz_NRC, faulthaz_NRC, probhaz_CEUSSSC)	Modified code and associated documentation	COMPLETED
Task 2b	Supporting the continuing use of the PSHA codes listed under Task 2a in the PEER PSHA code validation project.	N/A	~~12/31/20152016~~ COMPLETED
Task 2c	Complete development of batch scripts such that the PSHA codes listed above can produce uncertainty estimates ("fractile curves") for ground motion hazard.	Scripts and report or demonstration of use of scripts	06/09/2017 or as determined by the COR.
Task 2d	Complete modification of codes to produce soil hazard curves consistent with "Method 3" as described in NUREG/CR-6728.	Modified software and associated documentation	~~Closed out under this Task Order on 09/16/2016~~ COMPLETED
Task 2e	Complete development of documentation for the codes and associated batch scripts and provide training on the codes for NRC staff.	Training session with finalized documentation	~~03/15/2017~~ 07/07/2017 or as determined by the COR

Task 2f	Perform modifications to NRC PSHA code "probhaz_CEUSSSC" and develop scripts to run the CEUS SSC model with GMC model(s) other than EPRI (specifically including the USGS 2014 seismic hazard model) for a large number of sites.	Modified software and associated documentation with notes on implementation and use	~~08/1511/31/2016~~ 07/21/2017 or as determined by the COR

Deliverables Schedule For Task 3

Deliverable	Description	Quantity/Media	Date To Be Completed
Task 3a	~~Complete development of plain language summaries and fact sheets.~~Complete development of plain language summaries, fact sheets, and Q&As related to technical information resulting from work performed under Task 1, if requested.	Draft Summaries, fact sheets, and Q&A documents	TBD
Task 3b	Complete ~~Q & A developments.~~organization of, preparation for, and facilitation of stakeholder and public outreach meetings to discuss technical information resulting from work performed under Task 1, if requested.	~~Draft Q&A document(s)~~Draft report outlining agenda, attendees, logistics, handouts and documents.	TBD
Task 3c	Complete ~~organization of and preparation for stakeholder and public outreach meetings.~~ development of responses to public comments resulting from stakeholder and public outreach meetings held to discuss	Draft ~~report outlining agenda, attendees, logistics, handouts and documents~~responses to public comments.	TBD

	technical information resulting from work performed under Task 1, if requested.		
Task 3d	~~Attend and assist with facilitation of public outreach meetings.~~Complete assigned sections of the NUREG containing additional plant-by-plant information on the site hazard and site response analyses perfomed by staff for the seismic hazard reevaluations	~~N/A~~Draft NUREG sections	~~TBD~~ 04/02/2018 or as determined by the COR
Task 3e	~~Complete development of responses to public letters and comments~~Complete review and provide comments on the draft NUREG containing additional plant-by-plant information on the site hazard and site response analyses performed by staff for incorporation into the final NUREG.	~~Draft responses~~Comments on draft NUREG	~~TBD~~ 04/23/2018 or as determined by the COR
Task 3f	Complete preparation of the final NUREG formatted to camera-ready publication standards	Final NUREG formatted to camera-ready publication standards	06/22/2018 or as determined by the COR.

6. REQUIRED LABOR CATEGORIES

It shall be the responsibility of the contractor to assign qualified technical staff, employees, and subcontractors who have the required educational background and experience to meet both the technical and regulatory objectives of the work specified in this SOW. The NRC will rely on the representation made by the contractor concerning qualifications of the personnel proposed for assignment to this contract for assurance that all information contained in the technical and costs proposals, including resumes and conflict of interest disclosures, is truthful and accurate.

Technical Project Manager

Technical Subject Matter Experts (Geology, Seismology, PSHA Code Development)

The subject matter experts in geology must have experience in characterizing geologic features and seismic sources.

The subject matter experts in seismology must have experience in PSHA, ground motion prediction models, and seismic source characterization.

The subject matter expert(s) in PSHA code development must have experience in developing PSHA codes for the NRC.

Public Outreach Expert

The expert in public outreach mst have experience in preparing summary materials for public distribution and planning, setting up, and facilitating stakeholder and public outreach meetings.

Administrative Support Expert

Duties, responsibilities, and minimum qualifications for each labor category are as follows:

Task	Labor Category	Duties and Responsibilities	Minimum Qualifications
Task 1	Geologist(s)/Seismologist(s)	Geologists must review the SSC portion of the PSHA reports for the 3 plants and contribute to all activities under this task, as appropriate, as defined in Section 4 of this SOW. Seismologists must review the GMC portion of the PSHA reports for the 3 plants and contribute to all activities under this task, as appropriate, as defined in Section 4 of this SOW.	Geologists must have experience in characterizing geologic features and seismic sources. Seismologists must have experience in PSHA, ground motion prediction models, and seismic source characterization.
Task 2	PSHA Code Developer	The code developer must modify PSHA software for use by NRC staff in assessing (i.e., testing and confirming) PSHA results from licensees and complete all activities under this task as defined in Section 4 of this SOW.	Code developer must have experience in developing PSHA codes for the NRC.
Task 3	Public Outreach Expert	The public outreach expert must support NRC staff in developing and conducting stakeholder and public outreach meetings, if and as needed, and complete all activities under this task as defined in Section 4 of this SOW.	Public outreach expert must have experience in preparing summary materials for public distribution and planning, setting up, and facilitating ~~participating~~stake holder and ~~in~~ public outreach meetings.
Tasks 1, 2, and 3	Administrative Support Expert	The administrative expert must provide necessary support to other contractor staff.	

7. PERIOD OF PERFORMANCE

Task 1 – August 3, 2015 to September 30, ~~2017~~2018

Task 2 – August 3, 2015 to September 30, 2017

Task 3 – August 3, 2015 to September 30, ~~2017~~2018

8. PLACE OF PERFORMANCE

The work under this contract will be primarily performed at the Contractor's normal work locations. Writing sessions for ~~SA reports may~~the NUREG document might be held at NRC HQ in Rockville, Maryland.

9. SPECIAL CONSIDERATIONS

KEY PERSONNEL

The following positions are considered essential to the work being performed and shall be designated as Key Personnel:

[redacted]

The Contractor shall not substitute any Key Personnel without prior consent of the Contracting Officer Representative (COR) and written permission of the Contracting Officer (CO). Proposed substitutes should have qualifications comparable to those of the persons being replaced. The Contracting Officer will notify the Contractor within 7 days after receipt of all required information regarding consent on substitutes. No change in fixed unit prices may occur as a result of key personnel changes.

TRAVEL

CNWRA shall coordinate all travel in advance with the COR. The following assumptions about travel should be considered for planning the work activities:

Tasks 1 ~~and 3~~ – Two trips to NRC HQ by one CNWRA staff member based in San Antonio, TX, for technical discussions and participation in public meetings. ~~Dates are TBD~~. Cost = [redacted] per trip x 2 trips = [redacted] (COMPLETED)

~~Tasks 1 and 3 – Two trips to NRC HQ by one CNWRA staff member based in San Antonio, TX, for technical discussions, SA writing sessions, and participation in public meetings. Dates are TBD. Cost = [redacted] per trip x 2 trips = [redacted]~~

Task 2 – Two trips to NRC HQ by the PSHA coding consultant for training of NRC staff in use of the codes. ~~Dates are TBD~~. Cost = [redacted] per trip x 2 trips = [redacted] (COMPLETED)

Task 3 – One trip to NRC HQ by one CNWRA staff member based in San Antonio, TX, for preparation of the NUREG document. Date TBD. Cost = [redacted] per trip x 1 trip = [redacted]

SECURITY

The work performed under this contract will be UNCLASSIFIED.

TECHNICAL REPORTING REQUIREMENTS

The contractor must follow technical reporting requirements as stated in the base contract. Technical reports will typically include the following:

- Trip reports with meeting summaries, observations and recommendations.
- Technical letter reports.
- Draft and final technical evaluation reports (TER's) that summarize the work performed, results attained, findings, conclusions, and recommendations.

In all correspondence, the following identifying information must be included:

- JCN Number.
- Name of licensee
- Plant name
- Site name

Communications with the NRC and among contractor staff may be subject to hearing file requirements under 10 CFR Part 2. In this circumstance, the NRC COR or Alternate COR will identify the type of records that must be provided to the NRC for inclusion in the hearing files.