

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

BPA NO.

1. CONTRACT ID CODE

PAGE

OF PAGES

1

24

2. AMENDMENT/MODIFICATION NO.
0016

3. EFFECTIVE DATE

JUL 26 2012

4. REQUISITION/PURCHASE REQ. NO.
NRO-12-158

5. PROJECT NO. (If applicable)

6. ISSUED BY

CODE

3100

U.S. Nuclear Regulatory Commission
Div. of Contracts
P. Merriweather 301.492.3614
Mail Stop: TWB-01-B10M
Washington, DC 20555

7. ADMINISTERED BY (If other than Item 6)

CODE

3100

U.S. Nuclear Regulatory Commission
Div. of Contracts
Mail Stop: TWB-01-B10M
Washington, DC 20555

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

Numark Associates, Inc
1220 19th Street NW Suite 500
Washington, DC 20036-2405

(X) 9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

10A. MODIFICATION OF CONTRACT/ORDER NO.
NRC4207481 0025

10B. DATED (SEE ITEM 13)

CODE 788247377

FACILITY CODE

X

05-27-2008

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 ACKNOWLEDGMENT 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)

Obligate: \$35,000.00
2012-25-17-4-118 Q4159 252A 31X0200
FSS: 122371 NAICS: 541990 DUNS: 78824737713. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS,
IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(X) A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

D. OTHER (Specify type of modification and authority) Mutual Agreement

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 incorporate a revised SOW to reflect an increase the task order ceiling and add incremental funding in the amount of \$35,000.00.

Task Order Ceiling Amount: \$1,033,101.00 (Changed)

Total Obligated Amount: \$888,144.80 (Changed)

Period of Performance: 06/20/2011 - 02/28/2013 (Unchanged)

Continued on page 2.

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

16A. NAME AND TITLE OF SIGNER (Type or print)

Neil J. Numark, President

16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)

Pearlette Merriweather
Contracting Officer

16B. CONTRACTOR/OFFEROR

16C. DATE SIGNED

7/26/12

16B. UNITED STATES OF AMERICA

BY Pearlette Merriweather
(Signature of Contracting Officer)

16C. DATE SIGNED

7/26/12

NSN 7540-01-162-8070
PREVIOUS EDITION NOT USABLESTANDARD FORM 30 (REV. 10-83)
Prescribed by GSA - FAR (48 CFR) 53.243

SUNSI REVIEW COMPLETE

TEMPLATE - ADM001

JUL 30 2012

ADM002

The purpose of this modification is to: (1) add additional tasks (see SOW) thereby increasing the level of effort; (2) increase the task order ceiling from \$877,884.00 to \$1,033, 101.00; (3) add incremental funding in the amount of \$35,000.00.

Paragraph 2, page 2 of 2 under the basic Task Order 25 is hereby deleted in it's entirety and replaced with the following paragraph:

Task Order No. 25 shall be in effect from 5/28/2008 through 2/28/2013 with a cost ceiling of \$1,033,101.00. The amount of \$965,515.00 represents the estimated reimbursable costs, and the amount of \$67,585.00 represents the fixed fee.

Paragraph 3, page 2 of 2 under the basic Task Order 25, is hereby deleted in it's entirety and replaced with the following paragraph:

The amount obliged by the Government in respect to this task order is \$888,144.80, of which \$830,042.00 represents the reimbursable cost, and the amount of \$58,103.00 represents the fixed fee.

All other terms and conditions remain unchanged.

MODIFICATION
TASK ORDER STATEMENT OF WORK

JCN/Contract No. Q-4159	Contractor Numark Associates, Inc.	Task Order No. NRC-07-42-481 (025) MOD 16
Applicant AREVA NP Inc.	Design/Site EPR	Docket No. 052000020
Title/Description Review of EPR Standard Design Certification Application FSAR Sections 3.7.1, 3.7.2, and 3.7.3 for Seismic Design		
TAC No. RX0131	B&R Number 2012-25-17-4-118	SRP Section 3.7
NRC Task Order Project Officer (PO) Christine Briggs (301) 415-2713 Christine.Briggs@nrc.gov		
NRC Technical Monitor (TM) Jim Xu (301) 415-3024 Jim.Xu@nrc.gov		

REQUEST FOR PROPOSAL

A proposal is requested to perform the work described in this Statement of Work. The due date for your proposal is 4 p.m. (Washington, DC, local time), June 13, 2012 and shall consist of two parts: a technical approach and a cost estimate.

As a minimum, the technical approach shall substantiate your understanding of the requirements of the work, note any anticipated problem areas or deviations from the Statement of Work, identify key personnel who will perform the work, include resumes of those personnel not already in the contract, and address any potential conflict of interest issues. The following certification must also be submitted with your proposal: "I represent to the best of my knowledge and belief that the award of Modification No. 9 of Task Order No. 25 under Contract No. NRC-42-07-481 to Numark Associates does // or does not // involve situations or relationships of the type set forth in NRCAR 2009.570."

The contractor shall provide a staffing plan that specifically reflects services to be provided. Examples of the staffing plan are provided in Section J, Attachment 2 of the basic contract award document.

You are also required to identify any current/former NRC employees who have or will be involved, directly or indirectly, in developing the proposal, or in negotiating on behalf of your firm or in managing, administering or performing any purchase orders, contracts, consultant agreement or subcontract resulting from this proposal (list name, title and date individual left NRC and provide brief description of individual's role under this proposal.) If there are no current/former NRC employees involved, a negative statement is required.

The second part of your proposal shall be your cost estimate. Submit your cost estimate in accordance with the Federal Acquisition Regulation (FAR). Your proposal format along with supporting information in your own

format (information such as proposed labor hours and labor rates, cost of equipment and materials, etc.) which supports your estimated costs must be submitted.

CAUTION - It should be noted that this request for proposal does not commit the Government to pay any costs incurred in the submission of proposals or make necessary studies or designs for the preparation thereof, nor to procure or contract for the services in the enclosed Statement of Work. It is also brought to your attention that the Contracting Officer is the only individual who can legally commit the Government to the expenditure of public funds in connection with this proposed task order.

Your response to the subject RFP should be sent electronically to Pearlette.Merriweather@nrc.gov with a courtesy copy to Christine.Briggs@nrc.gov and Jim.Xu@nrc.gov.

The proposal shall be signed by an official authorized to bind the company, and it shall contain a statement indicating a proposal acceptance period of not less than 30 days.

1.0 BACKGROUND

The Office of New Reactors (NRO) is responsible for accomplishing key components of the Nuclear Regulatory Commission's nuclear reactor safety mission for new reactor facilities licensed in accordance with 10 CFR Part 52. As such, NRO is responsible for regulatory activities in the primary program areas of new reactor licensing including application reviews for reactor design certification (DC), early site permits (ESPs), combined operating license (COL) applications, and new reactor pre-application activities. Applications are submitted pursuant to Part 52 of Title 10 of the Code of Federal Regulations (10 CFR 52), "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants." The NRC reviews DC applications based on information furnished by nuclear steam supply system vendors pursuant to 10 CFR 52.47, "Contents of Applications."

A safety Standard Review Plan (SRP) (NUREG-0800) was prepared for the guidance of staff reviewers in the Office of New Reactors in performing safety reviews of applications to construct or operate nuclear power plants and the review of applications to approve standard designs and sites for nuclear power plants. The principal purpose of the SRP is to assure the quality and uniformity of the NRC staff safety reviews. The staff publishes the results of these reviews in a Safety Evaluation Report (SER).

2.0 OBJECTIVE

The objective of this task order is to obtain technical expertise from the contractor to assist the NRC staff in determining whether or not the subject design certification application meets appropriate regulatory requirements relating to Sections 3.7.1, 3.7.2, 3.7.3 and the associated Tier 1 information of the FSAR submitted with the EPR DC application.

Specifically, a review of SRP subsections 3.7.1, 3.7.2, and 3.7.3 is required to insure that the seismic analyses and design meet the applicable requirements of 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 2, 10 CFR Part 50, Appendix S and other applicable regulations. The review shall focus on the (1) seismic design parameters, (2) seismic input, (3) seismic model, (4) seismic system analysis including soil structure interaction analysis, (5) seismic subsystem analysis, and (6) computer programs used in the analysis of seismic category 1 structures. The level of effort for this task order is based on the expectation that the contractor is familiar with the review procedures of the SRP sections in the work scope and the technical

reviewer has the required knowledge and experience in the subject matter as outlined in Section 5 of this document.

The primary deliverable, or output of this regulatory review, shall be the Technical Evaluation Report (TER). The TER will serve as input to the NRC's SER which will document the NRC's technical, safety, and legal basis for approving the design certification. The TER documents the contractor's technical evaluation of a proposed design against relevant regulatory criteria. The technical evaluation should include a description of the proposed design and an analysis of the proposal in terms of regulatory requirements, established NRC positions (e.g., SRP or regulatory guides), industry standards, or other relevant criteria. The contractor should explain the methods used in its review of the design (e.g., a comparison of applicant's proposal against regulatory criteria, a review of input assumptions combined with use of approved methodology, or an independent calculation to confirm results presented by an applicant). The technical evaluation should be specific as to what information is relied on to form the basis for approving or denying the proposed design. The technical evaluation should also contain the contractor's specific conclusion that the proposed design is technically acceptable and meets regulatory guidance or other industry standards or reasons why the proposed design is unacceptable. The TER, and ultimately the SER, should be written in a manner whereby a person with a technical (non-nuclear) background and unfamiliar with the applicant's request could understand the basis for the staff's conclusions. The TER format is described in Attachment 1 to this Task Order Statement of Work (SOW).

This modification supports review of the AREVA proposed approach to address stability issues and NAB II/I issues. (See subtask 16 in Section 3.0)

The Defense Nuclear Facilities Safety Board (DNFSB) issued a letter on April 8th, 2011 requesting that the Department of Energy (DOE) address technical and software quality assurance issues related to potentially erroneous seismic analyses performed using the SASSI subtraction method. Since AREVA has used the SASSI subtraction method to develop the seismic demands in support of the EPR DC application, the staff has issued an RAI to request the applicant address the DNFSB SASSI issues. This modification supports the staff review of AREVA analyses to justify the technical adequacy of the seismic demands based on the SASSI subtraction method and close the related RAI (See subtask 17 in Section 3.0)

3.0 WORK REQUIREMENTS, SCHEDULE AND DELIVERABLES

Tasks/Standards	Scheduled Completion	Deliverables
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1.	<p>REQUIREMENT: Become familiar with the EPR FSAR Sections 3.7.1 through 3.7.3, the related sections of the FSAR Tier 1 information, and applicable regulatory guides. As a starting reference point, review the basis upon which the staff granted the design certification by reviewing the corresponding sections of the AP1000 DCD and the final SER issued for the AP1000 design. Attend NRC offered training on regulations and TER development. (Phase 1 task)</p> <p>STANDARD: Written confirmation that familiarization is complete.</p>	Two weeks after authorization of work	Documentation that assigned personnel has reviewed references
2.	<p>REQUIREMENT: Participate in an orientation/kick-off meeting with the NRC staff to discuss the scope of the work, expectations, and contract management. Establish an agreed upon schedule that is consistent and aligned with the NRC's EPM program. (Phase 1 task)</p> <p>STANDARD: Attendance by individuals designated by NRC.</p>	Four weeks after authorization of work	A jointly agreed upon schedule

<p>3. REQUIREMENT: Using applicable SRP acceptance criteria and regulatory guides as guidelines, review the EPR FSAR Sections 3.7.1 through 3.7.3, associated Tier 1 information, and related documents/appendices to determine the adequacy of these parts of the DC application. Determine if the seismic input and analysis methods, modeling approaches, and analysis codes for Category I structures proposed by the applicant meet the appropriate acceptance criteria. Review identified COL action items and interface parameters for sufficiency and adequacy. Identify a preliminary set of Tier 2 information to be characterized as Tier 2*. Identify issues and those aspects of the application that need additional or clarifying information. (Phase 1 task)</p> <ul style="list-style-type: none"> a. Prepare draft questions as input to formal Requests for Additional Information (RAIs). b. Prepare a draft TER for each of the 3.7 sections including a discussion of the RAI contents and their bases. c. Participate in conference calls with the applicant (if required by TM) to discuss the information to be provided or clarified to bring closure to the open issues. d. Prepare an RAI tracking table summarizing RAI text, applicant response, and status. <p>STANDARD: Provide: (1) Preliminary TER that follows the NRC provided template without deviation; (2) RAIs that follow NRC guidance in Section III, RAI Guidance, of Attachment 1 to the Contract Statement of Work without deviation; and (3) RAI tracking table in accordance with the provided template in Attachment 2 of this Task Order Statement of Work.</p>	<p>Eight weeks after the end of task 2</p>	<ul style="list-style-type: none"> a. Preliminary TER with RAIs if applicable b. An RAI tracking table
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<p>4. REQUIREMENT:</p> <p>a. Review responses to the RAI questions to determine if they adequately resolve the outstanding issues identified in Task 3. Update Tier 2* information. Identify any other open items. Develop input to new or supplemental RAIs as necessary. Incorporate the review results in the TER completed under Task 3. Update the RAI tracking table.</p> <p>b. Prepare a list of documents to be audited and issues to be discussed during an audit under Task 5.</p> <p>c. As a result of review efforts in Tasks 5, 6, and 7, review responses to the RAI questions to determine if they adequately resolve the outstanding issues. As necessary, develop input to new or supplemental RAIs. Update the RAI tracking table. Continue this process until closing of all open items at the end of Task 10.</p> <p>(Phase 2 & 3 task)</p> <p>STANDARD: Update TER with open items and RAI tracking table as RAIs are reviewed and resolved.</p>	<p>a. Review of RAI response within three weeks after receipt of the responses</p> <p>b. Updated TER, RAI tracking table, and audit list to be prepared two weeks prior to Task 5.</p> <p>c. On going review and response to RAI within three weeks after receipt of the applicant's responses</p>	<p>a. Updated RAI tracking table and TER with open items</p> <p>b. Audit List</p> <p>c. Input to new or supplemental RAIs</p> <p>d. Updated RAI tracking table monthly</p>
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<p>5. REQUIREMENT: Prepare for and travel to the applicant's designated facilities and participate in an NRC review team to accomplish the following: (Phase 2 task)</p> <ul style="list-style-type: none"> a. Audit the analysis reports and supporting calculations to determine the adequacy of the EPR seismic analysis and design. b. Evaluate and discuss the applicant's responses to the unresolved issues identified in Task 4 to establish plans for the resolution of the open items. c. Obtain information related to the seismic input, structural model, and other necessary information of the EPR Nuclear Island (NI) structures and base mat; containment internal structures and components; and other Category I structures and foundation. The information should be sufficiently detailed to enable the contractor to perform a comprehensive evaluation, including confirmatory analyses, of the applicant's seismic design. d. Prepare a trip report (as an input to the NRC Audit Report) to summarize the information reviewed, results of the audit, and meeting discussions. e. Prepare input to new or supplemental RAIs as necessary. <p>STANDARD: Complete evaluation as defined in Task. Submit Trip Report within two weeks of site review. Input to RAIs in accordance with NRC guidance.</p>	<p>Trip duration is one week.</p> <p>Deliverables are due two weeks after the trip.</p>	<ul style="list-style-type: none"> a. Trip Report b. Input to new or supplemental RAIs-
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<p>6. REQUIREMENT: Using the validated computer code such as "SASSI" and the structural models (including the model of soil foundation) of the EPR NI developed by AREVA, perform confirmatory soil structure interaction (SSI) analysis to verify the adequacy of the modeling techniques, analysis methods, computer codes used, and the resulting seismic response. Include the following: (Phase 2 task)</p> <ul style="list-style-type: none"> a. Review the adequacy of the seismic model and design information obtained from the applicant, select a site condition within the range of the foundation material shear wave velocity covered by the EPR DC application, and combine the developed foundation model with the fixed base structural model for confirmatory SSI analysis. Prepare a technical letter report (TLR). b. Perform confirmatory analyses by using the combined model obtained from Subtask 6a above and the input ground motion obtained from the applicant. Use public domain computer codes such as "SASSI". Prepare a TLR. c. Compare the confirmatory analysis results with the results provided by the applicant and address discrepancies between the two sets of results. Prepare a TLR. d. Compile the results of the work performed under Tasks 6.a, 6.b, and 6.c, and prepare a confirmatory analysis summary report. e. As necessary, prepare draft questions as input to formal RAIs arising from the confirmatory analysis results. <p>STANDARD: Provide three TLRs that summarize the contractor's assessment of the applicant's analysis and design information, the confirmatory analysis scope and results, and comparisons between the two sets of results, respectively. Provide a Confirmatory Analysis Summary Report in accordance with the outline and the format provided in Attachment 3 to this SOW. Submit input to RAIs in accordance with NRC guidance.</p>	<ul style="list-style-type: none"> a. Three weeks after receipt of design information b. Four weeks after completion of Subtask 6.a c. One week after completion of Subtask 6.b d. Two weeks after completion of Subtask 6.c e. One week after completion of Subtask 6.d 	<ul style="list-style-type: none"> a. Three technical letter reports b. Confirmatory Analysis Summary Report c. Input to RAIs as necessary
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<p>7. REQUIREMENT: Review FSAR revisions submitted by the applicant to identify any significant changes and their impact. Prepare input to formal RAIs as necessary to address FSAR changes. As requested by the TM, participate in conference calls with the applicant to clarify additional information needed to close open items and to assess the impact of FSAR revisions. For significant FSAR revisions and as requested by the TM, update the TER. (Phase 2 task)</p> <p>STANDARD: Participate in conference calls as requested. Update the RAI tracking table. Submit input to RAIs and updated TER in accordance with NRC guidance.</p>	<p>Three weeks after receipt of FSAR revision</p>	<p>a. Input to RAIs and updated TER as necessary</p> <p>b. Updated RAI tracking table</p>
<p>8. REQUIREMENT: Incorporate the results of the review efforts in Task 4c and update the TER as input to the staff's SER w/OI for Section 3.7. The TER should summarize information reviewed, key technical issues evaluated/resolved, any confirmatory analyses performed, significant staff evaluation findings and their technical bases covering the staff's review of the FSAR Section 3.7. (Phase 2 task)</p> <p>STANDARD: Complete TER that follows the NRC provided template without deviation. Update the RAI tracking table following the NRC template.</p>	<p>Four weeks after completion of Task 6 or as agreed upon with the TM to accommodate ACRS schedule</p>	<p>a. Updated TER with open items</p> <p>b. Updated RAI tracking table</p>
<p>9. REQUIREMENT: Prepare for and travel to the applicant's designated facilities to discuss the resolution of unresolved open items, and to perform an additional audit of analysis and design reports as needed. Discuss the confirmatory analysis results with the applicant and assist the staff in resolving the remaining open items. Prepare a draft trip report (as an input to the NRC Audit Report) to summarize the information reviewed, results of the audit, and meeting discussions. (Phase 2 task)</p> <p>STANDARD: Participate in audit. Submit a Trip Report within two weeks of review.</p>	<p>Trip duration is one week</p> <p>Deliverables due two weeks after the trip</p>	<p>Trip Report</p>
<p>10. REQUIREMENT: As needed and requested by the TM, provide technical support to the staff during ACRS review meetings. (Phase 3 task)</p> <p>STANDARD: Ensure presentation materials are reviewed and approved by NRC staff. Attend meetings, if requested.</p>	<p>TBD based on project schedule</p>	<p>Prepare presentation materials. Attend meetings, if requested.</p>

<p>11. REQUIREMENT: Prepare final TER with no OI's (as an input to the staff's FSER) including addressing any ACRS questions, and participate in ACRS review meetings as requested by the TM. (Phases 4 and 5 task)</p> <p>STANDARD: Complete TER that follows the NRC provided template without deviation. Attend meetings, if requested.</p>	TBD based on project schedule	Final TER with no open items
<p>12. REQUIREMENT: As needed and requested by the staff, provide technical support to the staff to prepare the FSER. (Phase 6 task)</p> <p>STANDARD: Provide technical support, if requested.</p>	TBD as needed	N/A
<p>13. REQUIREMENT: Prepare for and travel to applicant's designated facility for on-site review of applicant documents and discuss resolution of RAIs, as needed. These trips are intended to expedite the review process, and reduce the number of follow-up questions for resolution of RAIs. Multiple trips may be necessary based on project schedule. (Phase 2 task)</p> <p>STANDARD: Prepare audit plan, participate in audit, submit trip report, and update RAI tracking table and TER.</p>	<p>Trip duration is up to 3 days for each trip including travel time.</p> <p>Audit plan due two weeks before the trip</p> <p>Trip report due two weeks after the trip</p>	Audit Plan and Trip Report
<p>14. REQUIREMENT: Perform review of updated RAI responses and FSAR mark-ups as a result of EPR seismic reanalysis and support NRC in telephone calls with the applicant in providing feedback on the RAI responses (Phase 2 & 4 task)</p> <p>STANDARD: Update RAI tracking table as RAIs are reviewed and resolved</p>	TBD based on current project schedule	Feedback on RAI responses

<p>15. REQUIREMENT: Prepare for and travel to applicant's designated facility for on-site review of applicant documents of new seismic analysis and discuss resolution of RAIs, as needed. These trips are intended to expedite the review process, and reduce the number of follow-up questions for resolution of RAIs. <i>[Multiple trips may be necessary based on project schedule.]</i> (Phase 2 task)</p> <p>STANDARD: Prepare audit plan, participate in audit, submit trip report, and update RAI tracking table and TER.</p>	<p>Trip duration is up to 5 days for each trip including travel time.</p> <p>Audit plan due two weeks before the trip</p> <p>Trip report due two weeks after the trip</p>	<p>Trip Report(s)</p>
<p>16. REQUIREMENT: Review AREVA proposed approach to address stability issues and NAB II/I issues. Review additional analyses and calculations for resolving remaining 14 Phase 2 RAI issues. Participate in technical discussions with AREVA through telecons, web-based go-to meetings or face-to-face meetings. Complete SER/OI to ensure all identified safety issues are either resolved or path forward to resolution is clearly established. Trips to NRC headquarters may be needed to facilitate review progress. (Phase 2 task)</p> <p>STANDARD: Update RAI tracking table as RAIs are reviewed and resolved. Prepare trip reports.</p>	<p>TBD based on current project schedule</p> <p>Trip duration is up to 3 days for each trip including travel time.</p>	<p>Feedback on RAI responses</p> <p>Trip Reports</p>

<p>17. REQUIREMENT: Review AREVA proposed approach for addressing DNFSB raised issues regarding potential erroneous seismic response analyses using the SASSI subtraction method. Review AREVA analyses and calculations for justifying the seismic demand analyses applied in EPR seismic design. Participate in technical discussions with AREVA through telecons, web-based go-to meetings or face-to-face meetings, and audits. Resolve related RAI. Trips to NRC headquarters and applicant site may be needed. (Phase 4 task)</p> <p>STANDARD: Update RAI tracking table as RAIs are reviewed and resolved. Prepare trip reports.</p>	<p>TBD based on current project schedule</p> <p>Duration of trips to applicant site is one week for each trip including travel time.</p> <p>Duration of trips to NR Headquarters is three days for each trip including travel time.</p>	<p>Feedback on RAI responses</p> <p>Trip Reports</p>
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* These Work Schedules are subject to change by the NRC Contracting Officer (CO) to support the needs of the NRC Licensing Program Plan.

The Technical Monitor may issue technical instruction from time to time throughout the duration of this task order. Technical instructions must be within the general statement of work delineated in the task order and shall not constitute new assignments of work or changes of such a nature as to justify an adjustment in cost or period of performance. The contractor shall refer to Section G.1 of the base contract for further information and guidance on any technical directions issued under this task order.

Any modifications to the scope of work, cost or period of performance of this task order must be issued by the CO and will be coordinated with the NRO Project Officer.

4.0 TECHNICAL AND OTHER SPECIAL QUALIFICATIONS REQUIRED

As specified in the basic contract, 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 effort include:

Senior structural engineers with knowledge and experience in vibration analyses, development of seismic ground motion spectra and consistent time histories, soils-structure interaction analyses, development of in-structure floor response spectra, linear and non-linear dynamic and seismic analysis of systems, structures and components of nuclear power plants using sophisticated computer codes.

The contractor shall provide a contractor project manager (PM) to oversee the effort, and to ensure the timely submittal of quality deliverables so that all information is accurate and complete as defined in the base contract.

The NRC will rely on representations made by the contractor concerning the qualifications of the personnel assigned to this task order, including assurance that all information contained in the technical and cost proposals, including resumes, is accurate and truthful. The resume for each professional proposed to work

under this task order (contractor, subcontractor, or consultant) shall describe the individual's experience in applying his or her area of engineering specialization to work in the proposed area. The use of particular personnel on this task order is subject to the NRC technical monitor's (TM's) approval. This includes any proposed changes to key personnel during the life of the task order.

5.0 REPORTING REQUIREMENTS

Task Order Progress Report

The contractor shall provide a bi-weekly progress report summarizing accomplishments, expenditures, contractor staff hours expended, percent completed for each task under this task order, and any problems encountered by the contractor. The report shall be sent via e-mail to the NRC TM, Task Order Project Officer (PO) and CO.

Please refer to Section F of the basic contract award document for contract reporting requirements.

Technical reporting requirements

Unless otherwise specified above, the contractor shall provide all deliverables as draft products. The NRC TM will review all draft deliverables (and coordinate any internal NRC staff review, if needed) and provide comments back to the contractor. The contractor shall revise the draft deliverable based on the comments provided by the TM, and then deliver the final version of the deliverable. When mutually agreed upon between the contractor and the TM, the contractor may submit preliminary or partial drafts to help gauge the contractor's understanding of the particular work requirement.

The contractor shall provide the following deliverables in hard copy and electronic formats. The electronic format shall be provided in MS Word or other word processing software approved by the TM. For each deliverable, the contractor shall provide one hard copy and electronic copy to both the PM and the TM. The schedule for deliverables shall be contained in the approved project plan for the task order effort.

In all correspondence, include identifying information: JCN No.: Q-4159; Technical Assignment Control No. (TAC), if applicable, RX0131; Task Order No.: 25; the licensee: Areva NP ; and, the site: N/A.

Provide the following deliverables:

1. At the completion of Task 1, submit a TLR indicating that assigned personnel has reviewed the required references.
2. At the completion of Task 2, submit a project schedule.
3. At the completion of Task 3, submit a TER that contains, for each sub-section of the SER: the regulatory acceptance criteria, a description of the information proposed by the applicant including the assumptions for the analysis, design, and references to consensus standards, review findings (including the basis for the findings), as a result of comparison with the review guidelines, and a list of RAIs. Submit a tracking table for the RAIs. See Attachment 1 to this SOW for the outline, format and content of the TER report. See Attachment 1 in the base contract SOW for the guidelines for developing RAIs. See Attachment 2 to this SOW for the format of the RAI tracking table.

4. At the completion of Task 4.a, submit an update to the TER completed under Task 3 that incorporates review results and the findings from the resolution of the RAIs. Submit new or supplemental RAIs. Submit updated RAI tracking table.
5. At the completion of Task 4.b, submit an audit list.
6. During the performance of Task 4.c, submit RAIs as necessary and an updated RAI tracking table monthly.
7. At the completion of Task 5, submit a Trip Report to summarize the information reviewed, results of the audit, meeting discussions, a list of outstanding issues, and significance of these issues. Submit RAIs as necessary.
8. At the completion of Task 6.a, submit a TLR containing the contractor's assessment of the adequacy of the applicant's modeling of Category I structures for seismic analysis, selection of input ground motion time histories, assumptions, consideration of uncertainties within the soil parameters, analysis methods, and results. TLR should also contain a summary of how the site conditions are to be selected and a description of the development of SASSI model to be used for the confirmatory analysis.
9. At the completion of Task 6.b, submit a TLR describing the confirmatory analysis including the scope, objective, models, loadings, and parametric variations.
10. At the completion of Task 6.c, submit a TLR comparing the results of the confirmatory analysis with the results from the applicant's analysis. Discuss any significant differences and provide technical reasons for the same.
11. At the completion of Task 6.d, submit a Confirmatory Analysis Summary Report that compiles the results of Tasks 6.a through 6.c. See Attachment 3 to this SOW for outline and format of the report. If necessary, submit RAIs as a result of the work completed in Task 6.
12. During the performance of Task 7, following each revision of the FSAR, update the RAI tracking table, submit a list of open items and their significance, and submit RAIs as necessary. If required by the TM, submit an updated TER with open items.
13. At the completion of Task 8, submit an update to the TER developed in Task 4.a including the review information developed in Tasks 5, 6 and 7, and the RAI responses reviewed under Task 4.c. This will be the input to the staff's SER with open items. Submit a TLR summarizing the remaining open items and related issues to be discussed with the applicant in the second design audit under Task 9.
14. At the completion of Task 9, submit a Trip Report to summarize the information reviewed, results of the audit, and meeting discussions.
15. At the completion of Task 11, update the TER developed in Task 8 including closure of all the open items and the responses to ACRS questions, as necessary. Submit the final TER with no open items which forms the input to the staff's final safety evaluation report (FSER).
16. At the completion of Task 12, review the staff's FSER for adequacy and completion and provide written comments.

17. During the performance of Tasks 10 and 12, describe each request for assistance and the information provided in the Task Order Progress Report.
18. For the RAI tracking table and the TLRs, submit only electronic copies to the TM and Task Order Project Manager.
19. During the performance of Task 16 update RAI tracking table as RAIs are reviewed and resolved. Prepare trip reports.
20. **During the performance of Task 17 update RAI tracking table as RAIs are reviewed and resolved. Prepare trip reports.**

6.0 MEETINGS AND TRAVEL

The following travel assumptions should be considered in planning the work effort. It is likely that a smaller group than the entire review team will be necessary to accomplish some activities; the actual travel contingent will be determined by the NRC TM after discussion with the contractor PM. Travel in excess of the total number of person-trips must be approved by the NRC TAPM; travel within the work scope limits will be approved by the NRC TM.

- One, two-person, one-day working meeting to kick off project and for contractor orientation (Task 2)**
- One, two-person, one-day working meeting at NRC headquarters to discuss the preparation of the TER with open items (Task 4.a)
- One, two-person, five-day trip to the applicant's facility to perform first design audit (Tasks 5)
- One, two-person, one-day working meetings at NRC headquarters to discuss the findings and the conclusions of the confirmatory analysis (Task 6)
- One, two-person, five-day trip to the applicant's facility to perform second design audit (Tasks 9)
- Two, one-person, one-day meetings, if needed, for an ACRS meeting (Tasks 10 and 11)
- Four, two-person, two-day trips to applicant's facility, as required, to expedite RAI resolution (Task 13).
- One, three-person, five-day trip to applicant's facility as required, to review new calculations and expedite RAI resolution (Task 15)
- Two, three-person, three-day trips to NRC headquarters as required, to facilitate review progress (Task 16)
- **One, three-person, three-day trips to NRC headquarters as required, to facilitate review progress (Task 17)**
- **Two, three-person, five-day trips to applicant's facility as required, to review analyses and calculations (Task 17)**

**At the discretion of the NRC TM, quarterly progress meetings may be conducted at the contractor's offices or via telephone or video conference.

7.0 NRC FURNISHED MATERIAL

The following NRC furnished materials will be provided to the contractor together with the SOW:

- (a) CD-ROM containing the EPR FSAR including Sections 3.7.1 through 3.7.3 and the associated appendices.
- (b) CD-ROM containing the Final Safety Evaluation Report (FSER) and the Design Control Documents (DCD) for AP1000.

The contractor staff will identify any additional NRC documentations that are needed to perform the work, and the TM will determine whether it will be provided by the NRC or obtained directly by the contractor from NUDOCS, ADAMS, NRC public document room on the NRC website at www.nrc.gov.

8.0 LEVEL OF EFFORT

The estimated level of effort in professional staff hours apportioned among the tasks and by the labor category as follows:

Task(s)	Labor Category	Level of Effort FY 2008 (hours)	Level of Effort FY 2009 (hours)	Level of Effort FY 2010 (hours)	Level of Effort FY 2011 (hours)	Level of Effort FY 2012 (hours)	Level of Effort FY 2013 (hours)
1	Senior Structural Engineer	60					
2	Senior Structural Engineer	40					
3	Senior Structural Engineer	352					
4	Senior Structural Engineer	100	209	88			
5	Senior Structural Engineer	160					
6	Senior Structural Engineer		300				
7	Senior Structural		100	100			

	Engineer						
8	Senior Structural Engineer		100				
9	Senior Structural Engineer		160				
10	Senior Structural Engineer			40			
11	Senior Structural Engineer			100			
12	Senior Structural Engineer			40			
13	Senior Structural Engineer		200				
14	Senior Structural Engineer				80	20	
15	Senior Structural Engineer				160		
16	Senior Structural Engineer				490		
17	Senior Structural Engineer					450	100
All	Project Manager	40	55	20	15+17	5+12	
All	Admin				6	6	
Total		752	1124	388	255+513	25+468	100

9.0 PERIOD OF PERFORMANCE

The projected period of performance **continues through 2/28/2013.**

10.0 OTHER APPLICABLE INFORMATION**License Fee Recovery**

All work under this task order is fee recoverable under 10 CFR Part 170 and shall be charged to the appropriate TAC number(s).

Assumptions and Understandings:

The level of effort for Task 1 is based on the volume of materials to be reviewed; this task is for familiarity and not for evaluation.

The level of effort for Task 3 is based on the assumption that the contractor is familiar with the review procedures of SRP Section 3.7.

The level of effort for Task 4 is based on the assumption that there will be 100 RAIs including supplemental RAIs. Five days are allocated for updating the preliminary TER prepared in Task 3 to incorporate RAI responses.

The level of effort for Task 5 is based on one, two-person, five-day trip (including travel time) plus five days to prepare for the trip and to write the trip reports.

The level of effort for Task 6 is based on the confirmatory analysis performed on the AP1000 design certification. The scope of work also includes one, two-person trip to NRC headquarters to discuss the confirmatory analysis results.

The level of efforts for Task 7 is based on the assumption that there will be 5 revisions for the FSAR and it will take four days to review the effect of the changes. Five additional days are assumed for TER updates as may be requested by the TM.

The level of effort for Task 9 is based on one, two-person, five-day trip (including travel time) plus five days to prepare for the trip and to write the trip reports.

The level of effort for Task 10 is based on one, two-person trip to NRC headquarters for an ACRS meeting, and time needed to prepare presentation material.

The level of effort for Task 11 is based on one, two-person trip to NRC headquarters for an ACRS meeting, and time needed to prepare the final TER with no open items as input to the staff's FSER.

The level of effort for Task 13 is based on four, two-person two-day trip to applicant's offices including travel time, and time needed for preparation of travel plan and trip report. Number of trips, trip duration, and number of persons traveling may be adjusted, as needed, by the TM within the total estimated hours for the task.

The level of effort for Task 14 is based on the assumption that the contractor is familiar with the seismic analysis methods of SRP 3.7 and will approximately need 100 hours of additional review effort for review of the new seismic analysis.

The level of effort for Task 15 is based on one three-person three-day trip to applicant's offices including travel time, and time needed for preparation of travel plan and trip report. Number of trips, trip duration, and number of persons traveling may be adjusted, as needed, by the TM within the total estimated hours for the task.

The level of effort for Task 16 is based on the assumption that the contractor is familiar with the seismic analysis methods of SRP 3.7 and the applicant will be able to provide an approach to identified complex technical issues which the contractor will review and recommend for staff acceptance. The review will approximately need 490 hours of additional review effort to resolve or have a path forward to resolution for remaining 14 unresolved RAI issues related to the seismic analysis.

The level of effort for Task 17 is based on the assumption that the contractor is familiar with the DBFSB issues with respect to the SASSI subtraction method and the applicant will be able to provide an approach to resolving complex technical issues which the contractor will review and recommend for staff acceptance. The review will approximately need 650 hours of additional review effort including audits to resolve the subtraction issues and affirm the quality of the seismic analyses in support of the EPR seismic design.

It is assumed that the contractor has access to the NRC furnished material available on the Internet.

It is understood that the scope of the review consists of conference calls with the NRC staff, and with the NRC staff and the applicant, to discuss open items in an attempt to obtain additional information or reach resolution.

During the course of the review, the Technical Monitor, and possibly other NRC personnel, may travel to the contractor offices to discuss the status of the review and participate in the resolution of open items. It is assumed that the level of effort covers such meetings.

Attachments:

1. Outline, Format, and Content for the TER input
2. Sample Request for Information (RAI) Tracking Table
3. Sample Outline and Format for the Confirmatory Analysis Summary Report

Attachment 1

Outline, format, and sample for the Technical Evaluation Report (TER) (draft SER input)

X.Y.Z Title of Section

X.Y.Z.1 Regulatory Criteria

Develop an outline that follows the format and topics presented in the AREAS OF REVIEW section of the appropriate SRP section. This information will correspond to the SRP sections that are the subject of this Task Order. For each unique SRP review area contained in the TER, the contractor should specify the acceptance criteria that were used for its review. Summarize the applicable regulations and other regulatory references, including regulatory guides, generic letters, or NRC staff positions, that are relevant to this topic.

Technical reviewers are encouraged to use the descriptions of acceptance criteria from previously issued Safety Evaluation Reports for completed design certifications (e.g., NUREG-1793 for the AP1000 Final Safety Evaluation Report) when applicable.

X.Y.Z.2 Summary of Technical Information

Describe the key technical points that were made in the application. It is not necessary to restate the application verbatim or to address all the details in the application.

X.Y.Z.3 Technical Evaluation

Document the contractor's evaluation of the application against the relevant regulatory criteria. The evaluation should support the contractor's conclusions as to whether the regulations are met. State what the contractor did to evaluate the applicant's submittal. The contractor's evaluation may include verification that the applicant followed applicable regulatory guidance, performance of independent calculations, and validation that the appropriate assumptions were made. The contractor may state that certain information provided by the applicant was not considered essential to the contractor's review and was not reviewed by the contractor. While the contractor may summarize the information offered by the applicant in support of its application, the contractor should clearly articulate the bases for its conclusions. The documentation of the bases of the contractor's conclusions should be comprehensive, equally addressing the application sections which did not require independent calculations or requests for additional information as well as those requiring such efforts.

Contractor should provide a clear and concise description of any request for additional information (RAIs). The description should include a justification of the requested information that the requested information is not provided in the application and is absolutely needed to determine or confirm whether the relevant regulatory requirements (articulate specific requirements) have been met. The contractor should discuss its technical evaluation of the licensee's response to the RAIs and determine whether it is acceptable. The contractor should clearly articulate the bases for its acceptance or rejection. If the RAI response is not acceptable, it will be classified as an 'open item'. All open items will be resolved in Phase 3.

X.Y.Z.4 Conclusions

The contractor shall follow the suggested language provided in the Evaluation Findings section in SRP. Summarize the contractor's conclusions regarding the application, including words such as the following. As set forth above in Sections X.Y.Z.2 and X.Y.Z.3 of this report, [provide specific bases for conclusions that follow]. Accordingly, the staff concludes that the application meets[or, if applicable, does not meet] the relevant requirements of 10 CFR Part XX and is [or, if applicable, is not] acceptable.

X.Y.Z.5 References

Attachment 2Sample Request for Additional Information (RAI) Tracking Table

RAI Tracking Table
AREVA NP U.S. EPR Design Certification – SER Section 3.7

RAI Number	Question Summary	Full RAI Text / Applicant Response / Staff Assessment
3.7-xx	Provide a summary of the question	<u>Text:</u> <i>Provide full text of RAI.</i> <u>[Applicant Response] (xx/xx/0x):</u> <i>Summarize applicant response</i> <u>Staff Assessment:</u> <i>Provide a detail description of the staff assessment, technical basis, and conclusion [resolved/unresolved]</i> <u>Supplemental RAI (if any)</u> <i>Repeat the above entries.</i>

Attachment 3**Sample Outline and Format for the Confirmatory Analysis Summary Report**

In preparing the Confirmatory Analysis Summary Report provide the following information as a minimum.

1. Introduction

Summarize the background information for the overall technical assistance efforts. Describe the contractor's evaluation efforts and the role of the confirmatory analysis. Describe the arrangement of the report.

2. Scope and Purpose of Confirmatory Analysis

Explain the purpose and the objectives of the confirmatory analysis. Describe the scope of the analysis and its adequacy to provide reliable insight into the applicant's design. Explain how the objectives are achieved.

3. Evaluation of Applicant's Analyses

Summarize AREVA's seismic model for analyzing the Nuclear Island structures and other Category I structures. Describe the computer codes used, modeling assumptions, modeling parameters used in input, boundary conditions, and some key results. Provide the contractor's assessment of the adequacy of the above information.

4. Confirmatory Analysis

Describe the confirmatory analysis features including modeling of foundation soil, combined foundation structure dynamic model, computer codes used, assumptions, boundary conditions, & input earthquake time histories. Summarize key results of the confirmatory analysis, including seismic response and floor response spectra at key locations such as foundation mat, Reactor Vessel support, etc.

5. Analysis Results Assessment

Provide comparisons between the confirmatory analysis results and those submitted by the applicant. Highlight agreement in results and identify and discuss deviations. Explain the technical bases for the deviations and their significance. Provide conclusions in terms of the adequacy of the applicant's design.

6. Summary and Conclusions

Summarize the evaluation findings and conclusions based on the efforts detailed in this report.