

## AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

BPA NO.

1. CONTRACT ID CODE

PAGE

1

OF

1

2. AMENDMENT/MODIFICATION NO.

M001

3. EFFECTIVE DATE

See Block 16c

4. REQUISITION/PURCHASE REQ. NO.

NRO-11-305

Dated: 8/4/2011

5. PROJECT NO.(If applicable)

6. ISSUED BY

CODE

3100

U.S. Nuclear Regulatory Commission  
Div. of Contracts  
Attn: Matthew J. Bucher  
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)

ENERGY RESEARCH, INC.

6189 EXECUTIVE BLVD

ROCKVILLE MD 208523901

(X)

9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

10A. MODIFICATION OF CONTRACT/ORDER NO.  
GS23F0110M NRC-HQ-11-F-42-0002

10B. DATED (SEE ITEM 13)

06-30-2011

CODE 621211259

FACILITY CODE

X

## 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)

B&amp;R#: 2011-25-17-4-118 JC: Q4251 B.O.C: 252A APPN: 31X0200

Obligates Funds: \$0.00 FSS Number: 113837

NACIS: 541130 DUNS Number: 621211259

13. 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).

X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: F.A.R 43.103(a) Bilateral Contract Modification

D. OTHER (Specify type of modification and authority)

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 revise the Statement of Work. Therefore, delete the original Statement of Work and replace with attachment 1, statement of work dated 8/11/2011. The reason for the statement of work modification dealt with section 5.0 of the statement of work and changed the reporting requirements from bi-weekly to monthly.

Obligation Amount: \$ 68,573.60

Ceiling Amount: \$253,418.12

Period of Performance: 6/30/2011-9/30/2012

Except as specified herein, all other terms, conditions and pricing remain unchanged and in full force and effect.

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.

15A. NAME AND TITLE OF SIGNER (Type or print)

Mohsen Khatib-Rahbar, President

15A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)

Matthew J. Bucher  
Contracting Officer

15B. CONTRACTOR/OFFEROR

(Signature of person authorized to sign)

15C. DATE SIGNED

8/15/11

15B. UNITED STATES OF AMERICA

(Signature of Contracting Officer)

15C. DATE SIGNED

8-16-2011

NSN 7540-01-152-8070  
PREVIOUS EDITION NOT USABLE

SUNSI REVIEW COMPLETE

AUG 17 2011

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

TEMPLATE - ABM001

ADM002

## TASK ORDER STATEMENT OF WORK

Revision 1 dated: 8/11/2011

### 1.0 BACKGROUND

Combined Operating License (COL) Applications are submitted pursuant to Part 52 of Title 10 of the *Code of Federal Regulations* (10 CFR 52), "Licenses, Certifications, and Approvals for Nuclear Power Plants." The U.S. Nuclear Regulatory Commission (NRC) reviews COL Applications based on information furnished by electric utility companies pursuant to 10 CFR 52.79, "Contents of Applications; Technical Information in Final Safety Analysis Report."

A Standard Review Plan, SRP, (NUREG-0800) is 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 staff safety reviews.

An Environmental Safety Review Plan, ESRP, (NUREG-1555) is prepared for the guidance of staff reviewers in performing environmental reviews of applications related to nuclear power plants. The ESRPs are companions to regulatory guides that address siting and environmental issues. As with NUREG-0800 the purpose of the ESRP is to assure the quality and uniformity of environmental reviews.

The staff publishes the results of these reviews in a Safety Evaluation Report (SER).

## 2.0 OBJECTIVE

Since 2008, under earlier task orders whose legacy contract expires June 2011, contractor support and assistance were provided to the NRC staff in performing independent evaluations of the completeness and technical adequacy of the Level 2 and Level 3 probabilistic risk assessments (PRAs), deterministic severe accident evaluations, and severe accident mitigation design alternatives (SAMDA) analyses for the EPR and US-APWR designs certification (DC) applications. These evaluations were performed for the purpose of: (1) establishing that the technical quality of the Level 2 PRAs are sufficient to assure that the Commission's risk guidelines are satisfied; (2) developing insights into severe accident progression and phenomenology, containment performance, and important risk contributors and design features; and (3) identifying any structures systems or components (SSCs) that should be subject to additional regulatory controls (i.e., ITAAC or COL action items). This contractor support and assistance included:

- Performing confirmatory calculations and considering their results during both the preparation of requests for additional information (RAIs) and technical evaluation reports (TER).
- Documenting the evaluations and open items in draft TERs.
- Identifying additional information needed to resolve open items.
- Reviewing the responses from the applicants on all issues raised during the review of the Level 2 and 3 PRAs and deterministic severe accident evaluations, including new and revised analyses requested in response to RAIs.
- Identifying additional information needed to resolve remaining technical concerns and supporting further interactions with the applicants to ensure that the issues were well understood and to arrive at an acceptable path to resolution.
- Conducting preliminary reviews of SAMDA submittals provided in applicant's Environmental Reports to examine the completeness of design alternatives considered and the reasonableness of the analyses of risk reduction and costs for each candidate improvement.

The objective of this contract is to obtain technical assistance to support the NRC staff in completing the independent evaluations of the Level 2 and Level 3 PRAs, deterministic severe accident evaluations, and SAMDA analyses for the EPR and US-APWR DC applications. The scope of work includes providing technical support to NRC staff in the resolution of remaining open items associated with this subject area, including performing necessary confirmatory assessments and identifying additional information needed to resolve remaining technical concerns. The scope also includes updating the draft TERs for the PRAs, severe accident evaluations, and SAMDA analyses for the EPR and US-APWR designs to reflect the resolution of any previously identified open items/issues and overall conclusions of the reviews.

### 3.0 WORK REQUIREMENTS, SCHEDULE AND DELIVERABLES

Tasks/Standards	Scheduled Completion	Deliverables
<p>1. <b>REQUIREMENT:</b> The contractor shall provide technical support to NRC staff in the resolution of open items as related to the risk of severe accidents for the EPR DC application, including Level 2 PRAs, deterministic severe accident evaluations, and SAMDAs. This support may include further interactions with the DC applicant, as appropriate, to ensure that the issues are well understood and to arrive at an acceptable path to resolution. This effort may include confirmatory assessments; identification of additional information needed to resolve any remaining technical concerns or open items (which should be provided to the NRC in the form of RAIs for follow-up discussion with the DC applicant); and evaluation of the applicant's responses to additional RAIs.</p> <p>The contractor shall update the associated draft TERs for PRAs, severe accidents, and SAMDAs to reflect the resolution of any previously identified open items and issues, and overall conclusions of the reviews. The contractor shall incorporate NRC comments on the updated TERs and issue the documents as final TERs.</p> <p><b>STANDARD:</b></p> <ul style="list-style-type: none"> <li>• Additional or clarifying information needed to resolve identified issues or open items shall be provided to the NRC in the form of RAIs for transmittal to the DC applicant.</li> <li>• The final TERs will be in a format that can be incorporated into NRC staff SERs with minimal changes.</li> </ul>	<p>* 15 months after start of task</p>	<p>RAIs, if applicable, and Final Technical Evaluation Reports</p>

Tasks/Standards	Scheduled Completion	Deliverables
<p>2. <b>REQUIREMENT:</b> The contractor shall provide technical support to NRC staff in the resolution of open items as related to the risk of severe accidents for the US-APWR DC application, including Level 2 and 3 PRAs, deterministic severe accident evaluations, and SAMDAs. This support may include further interactions with the DC applicant, as appropriate, to ensure that the issues are well understood and to arrive at an acceptable path to resolution. This effort may include confirmatory assessments; identification of additional information needed to resolve any remaining technical concerns or open items (which should be provided to the NRC in the form of RAIs for follow-up discussion with the DC applicant); and evaluation of the applicant's responses to additional RAIs.</p> <p>The contractor shall update the associated draft TERs for PRAs, severe accidents, and SAMDAs to reflect the resolution of any previously identified open items and issues, and overall conclusions of the reviews. The contractor shall incorporate NRC comments on the updated TERs and issue the documents as final TERs.</p> <p><b>STANDARD:</b></p> <ul style="list-style-type: none"> <li>• Additional or clarifying information needed to resolve identified issues or open items shall be provided to the NRC in the form of RAIs for transmittal to the DC applicant.</li> <li>• The final TERs will be in a format that can be incorporated into NRC staff SERs with minimal changes.</li> </ul>	<p>* 15 months after start of task</p>	<p>RAIs, if applicable, and Final Technical Evaluation Reports</p>
<p>3. <b>REQUIREMENT:</b> Participate in technical meetings and conference calls between NRC staff and the DC applicants, as needed, concerning Level 2 and 3 PRAs, deterministic severe accident evaluations, and SAMDAs for the designs. As necessary, provide presentations to the Advisory Committee for Reactor Safeguards (ACRS), Commission, and industry groups, and/or support to the NRC staff in preparing such presentations.</p> <p><b>STANDARD:</b> Ensure presentation materials are reviewed and approved by NRC staff.</p>	<p>To be determined</p>	<p>Prepare presentation materials and attend meetings, if required</p>

\* These Work Schedules are subject to change by the NRC Contracting Officer (CO) to support the needs of the NRC Licensing Program Plan.

The NRC Technical Monitor (TM) 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 contract 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.

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**

The contractor shall provide individuals who have the required educational background and work experience to meet the objectives of the work specified in this contract. Specific qualifications for this effort include:

- (1) Development and peer review of Level 2 and 3 PRAs and deterministic severe accident evaluations, including treatment of internal and external events during at-power and shutdown conditions;
- (2) Light Water Reactor plant systems, including the design and functional performance of passive systems, containment systems, and severe accident features;
- (3) Thermal-hydraulic, severe accident progression, and offsite consequence analyses, including familiarity with the MAAP, MELCOR, CONTAIN, and MACCS2 computer codes;
- (4) Specialized techniques for treatment and quantification of severe accident phenomena (e.g., ROAAM);
- (5) PRA quality standards and the use of PRA methodologies and results in commercial nuclear reactor applications; and
- (6) NRC regulations, technical specifications, and inspections related to commercial nuclear power plant operations.

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

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

### **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-4xxx; Technical Assignment Control No. (TAC), RX0xxx(EPR) and RX0xxx(APWR); Contract NO.: NRC 41-11-xxx; and the applicant.

1. In Task 1, submit a description of any additional information needed to resolve remaining issues, technical concerns, or open items in the form of RAls for transmittal to the EPR DC applicant. At the completion of Task 1, submit updated TERs for Level 2 PRA, deterministic severe accident evaluations, and SAMDAs that document the results of the review, the resolution of any previously identified open items, and the overall conclusions of the reviews. Incorporate NRC comments on the updated TERs and issue the documents as final TERs.
2. In Task 2, submit a description of any additional information needed to resolve remaining issues, technical concerns, or open items in the form of RAls for transmittal to the US-APWR DC applicant. At the completion of Task 2, submit updated TERs for Level 2 and 3 PRA, deterministic severe accident evaluations, and SAMDAs that document the results of the review, the resolution of any previously identified open items, and the overall conclusions of the reviews. Incorporate NRC comments on the updated TERs and issue the documents as final TERs.

### **6.0 MEETINGS AND TRAVEL**

The following meeting and travel requirements are anticipated for planning purposes:

1. Six, two-person, one-day trips to NRC Headquarters in Rockville, Maryland to meet with the staff of the NRC and/or subject DC applicants to discuss the results of the evaluations, and to prepare or provide presentations to the ACRS, Commission and industry groups.\*

Additional travel will be coordinated with the NRC TM as the need for such travel is identified to ensure it supports the timely completion of work.

\*At the discretion of the NRC TM, meetings may be conducted 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 to facilitate successful completion of this project:

- Level 2 and 3 PRAs, deterministic severe accident evaluations, and SAMDA submittals for the EPR and US-APWR DC applications.

## **8.0 LEVEL OF EFFORT**

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

<b>Task(s)</b>	<b>Labor Category</b>	<b>Level of Effort FY-11 (hours)</b>	<b>Level of Effort FY-12 (hours)</b>
1	Level 2 and 3 PRA, severe accident, and SAMDA experts and analysts	140	272
2	Level 2 and 3 PRA, severe accident, and SAMDA experts and analysts	210	408
3	Level 2 and 3 PRA, severe accident, and SAMDA experts and analysts	20	40
Tasks 1-3	Project Manager	200	380
<b>Total</b>		570	1100

## **9.0 PERIOD OF PERFORMANCE**

The projected period of performance is 15 months from date of award.

## 10.0. OTHER APPLICABLE INFORMATION

### a. License Fee Recovery:

All work under this contract is fee recoverable and must be charged to the appropriate TAC number(s).

### b. Assumptions and Understandings:

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 subject DC applicants, to discuss open items in an attempt to obtain additional information or reach resolution.

The primary deliverables, or outputs of this regulatory review, shall be the TERs. The TERs will serve as input to the NRC staff's SERs, which will document the NRC's technical, safety, and legal basis for approving the EPR and US-APWR DC applications. The TERs must provide sufficient information to adequately explain the NRC staff's rationale for why there is *reasonable assurance* that public health and safety is protected. The TERs, and ultimately the SERs, 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.